Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL, AND OTHER IMPROVEMENTS

VOLUME XII. NEW-YORK, JANUARY 31, 1857. NUMBER 21.

THE
Scientific American,
PUBLISHED WEEKLY
At 128 Fulton street, N. Y. (Sun Buildings.)
BY MUNN & CO.
O. D. MUNN, S. H. WALES, A. E. BEACH.

Responsible Agents may also be found in all the principal cities and towns in the United States.

Sampson Low, Son & Co., the American Booksellers, 47 Ludgate Hill, London, Eng., are the English Agents to receive subscriptions for the Scientific American.

Single copies of the paper are on sale at the office of publication and at all the periodical stores in this city, Brooklyn, and Jersey City.

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Value of the Smelling Faculty

In Sir W. Temple's essay on "Health and Long Life," he says :—

"Fumigation, or the use of scents, is not, that I know of, at all practiced in our modern physic, nor the power and virtues of scents considered among us, yet they may have as much power to do good, for ought I know, as harm, and contribute to health as well as disease, which is too much felt by experience in all that are infectious, and by the operation of some poisons that are received by the smell. How reviving, as well as pleasing, some scents of herbs and flowers are, is obvious to all; how great virtues they may have in diseases, especially of the head, is known to few, but may easily be conjectured by any thinking man.

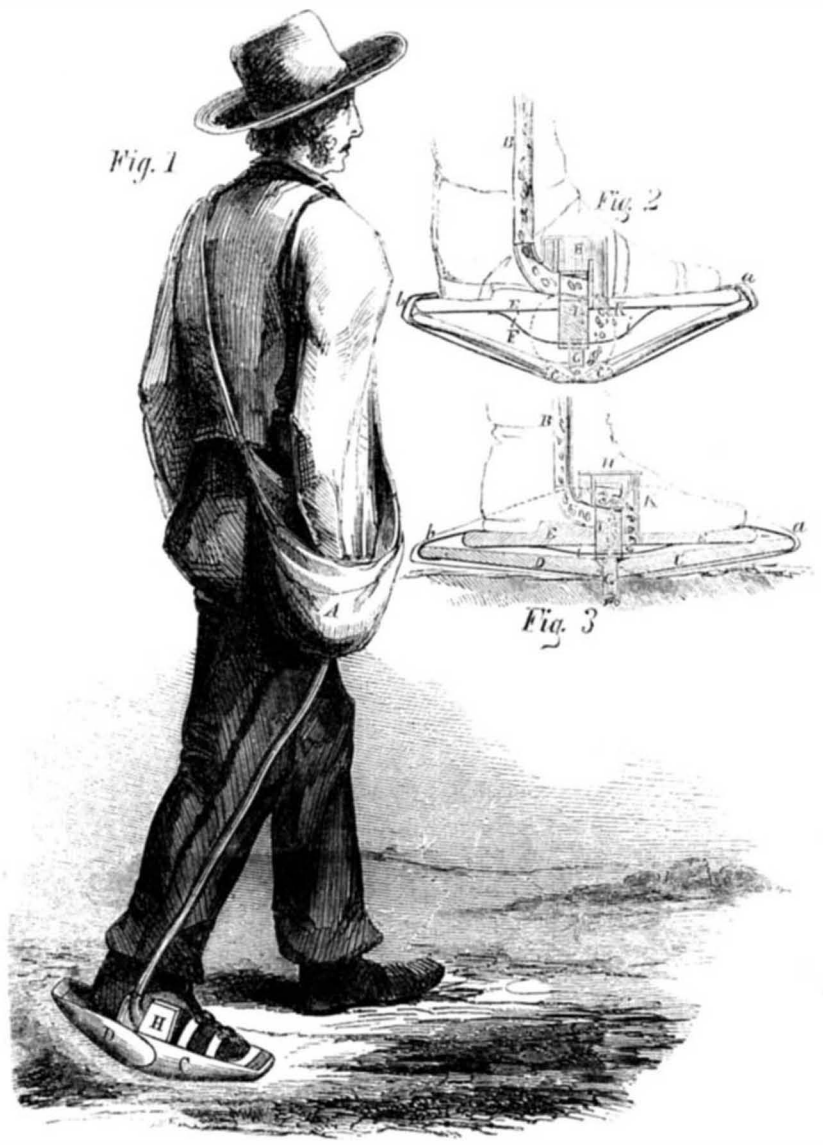
I remember that, walking in a long gallery of the Indian House of Amsterdam, where vast quantities of mace, cloves, and nutmegs were kept in great open chests all along one side of the room. I found something so reviving by the perfumed air, that I took notice of it to the company with me, numbering many persons, and they all were sensible of the same effect, which is enough to show the power of smells, and their operations both upon the health and humor."

Of our five senses, that of smelling has been treated with comparative indifference. However, as knowledge progresses, the various faculties with which the Creator has thought proper in his wisdom to endow man will become developed, and the faculty of smelling will meet with his share of tuition as well as sight, hearing, touch, and taste.

St. Paul tells the Corinthians, "that there should be no schism in the body, but that the members should have the same care one for another. And whether one member suffer all the members suffer with it; or one member be honored, all the members rejoice in it; nay, much more those members which *seem* to be more *feeble are necessary*. If the whole body were an eye, where were the hearing? If the whole were an ear, where were the smelling?" These arguments appear so conclusive in favor of a just and proper estimation of the value of smelling, that it would seem impossible to neglect it without bodily suffering as a consequence.

Practically, the author has always found it so. Among the lower orders, bad smells are little heeded; in fact, "noses have they, but they smell not;" and the result is, a continuance to live in an atmosphere laden with poisonous odors, whereas, any one with the least power of smelling retained, shuns such odors, as they would any other thing that is vile or pernicious. In the public schools "common things" are now being taught; to complete the idea, youth must be instructed that when the nose is offended, the body will indirectly suffer. If they are not taught to know by name every odor that they smell, they can at least be made familiar with the deadly effects of sulphuretted hydrogen, and others of the putrescent gases, and so avoid them in future life.—[Piesse's Art of Perfumery.

FOOT CORN PLANTER.



Although this is not the season for planting corn, or conducting agricultural operations in the field, it is perhaps the most important period of the year for agriculturists to lay out their plans, and provide the implements, tools, &c., for their next season's labor. This is one reason why we deem the illustrated descriptions of agricultural machines in our columns to be very useful at the present time.

The accompanying figures illustrate the Foot Corn-Planter of G. A. Meacham, of this city.

Figure 1 shows its application in planting corn or seeds. Fig. 2 is a vertical section, showing the position of the parts of the planter, when the foot of the operator is raised; and fig. 3 is a section of the planter, showing its position when the foot is pressed down, and pressing the cam into the soil. Similar letters refer to like parts.

This small, neat corn-planter is buckled on the foot. The operator carries the corn for planting in a small bag, A, suspended from his shoulder; the planter is connected to this bag by an elastic tube, B, through which the corn or seed is conveyed. D C, in fig. 1, represent two outside slips of metal to protect the bottom part, but we will refer to these letters as placed on figs. 2 and 3, representing inclined pieces of wood divided at the middle, but attached there by strips of elastic cloth, *e c*, fig. 2—one at each side—to allow them to close and open to permit the covering piston to pass between them. These two pieces, D C, are also attached at the heel and toe to the sole piece, E, by strips, *a b*, of elastic cloth. The two inclined pieces, C D, and the sole piece, E, when the foot is not pressed down, as in fig. 2, are so arranged as to form a chamber or space, F, between them. To the sole piece is fastened a piston or seed coverer, G, made of a square piece of wood, the object of which is to bury the corn or seed in the ground at every step, when the foot is pressed down, as in fig. 3.

A small metal box, H, is secured in the sole piece, E, at one side. In this works a small conveyor or plunger, I, secured to a flat bow spring, *i i*, the tension of which is downwards; this spring is attached to the under side of the sole piece.

The corn passes down the tube, B, and enters the small box, H, which has a small top chamber, with a hinged inclined bottom; it measures the exact number or quantity of kernels of corn or seed to be admitted to a hill. When the right foot of the operator is raised to make a step, as in fig. 2, the corn has free access to the chamber in H, because the spring, *i* holds the plunger, I, down. When the foot is down on the ground, as in fig. 3, to press the corn in the ground by piston G, being forced down between the pieces, C D, which are thrust open; the plunger, I, is then pressed upwards, and its inclined hinged bottom forces upward and forward the corn for the next hill through a hole in the box, thence down a channel, K, through the foot piece, E, into the chamber, F, as shown in fig. 2. When the foot is lifted for the next step, the piston, G, is withdrawn through the opening in the middle, between C D, and the corn for the next hill settles below the piston in the center, as shown in fig. 2, therefore, when the foot is pressed down to plant the next hill, the piston, G, carries the corn before it, thrusting it into the soil, as represented in fig. 3; and so on successively until the whole field is planted by the operator simply walking over it.

The weight of the operator coming upon his foot, does all the work, and a field of corn is thus planted as fast as a man can walk, and in perfect squares, when the fields is laid out for cultivating it by plowing both ways, avoiding hoeing. It is thus well adapted for the western and southern country, where there are such large corn fields. Horse-power planters cannot plant so accurately in squares. This foot planter is simple and strong, and we are informed that it is not liable to get out of repair. From its simplicity it can be manufactured very cheap, and it is so small and compact, that it may be carried in the pocket of a man's coat.

A patent was issued for it on the 10th of June last. More information respecting it may be obtained by letter addressed to the patentee, Geo. A. Meacham, No. 290 (office 13) Broadway, this city.

Curious Effect upon the Telegraph Wires.

During the greatest intensity of the snow storm on Sunday night, the electrical effect on the wires of the magnetic telegraph, in the office at Chestnut street, near Third, was curious and striking. There was a continual snapping, cracking and flashing, like the noise when wood is burning briskly. At one place, on a covered wire, the stream of electricity suddenly appeared about the size of the flame from an ordinary gas burner, and continued to burn just like a gas light for more than five minutes. On examining the wire, it was found that half an inch of the covering was burned off it and the wire beneath it, with which it was in contact. A correspondent calls our attention to similar electrical indications observed elsewhere. He says his brother, who was on a visit at a friend's house, in the western part of Green street, observed that on approaching the gas fixture and the register belonging to the heater, a spark of electricity was received, with a shock severe enough to be unpleasant. It was noticed that the same effect was produced by applying the knuckles to some persons in the house; they appeared to be charged with electricity. He communicates the fact for the purpose of calling the attention of electricians to the subject.—[Philadelphia Ledger.

The Atlantic Telegraph.

A bill passed the Senate on the 22d, appropriating $70,000 for the conveyance of messages on the Atlantic telegraph. This is a law forming a contract with the Telegraph Company to carry messages upon the same conditions as the contract entered into with the British Government. The contract is as follows:—

"The British Government shall have a priority in the conveyance of their messages over all others, subject to the exception only of the Government of the United States, in the event of their entering into an arrangement with the Company similar in principle to that of the British Government; in which case the messages of the two Governments shall have priority in the order in which they arrive at the stations."

French Undulating Railroad.

A railroad is proposed to be constructed near Lyons, France, on steep gradients, with a view to avoid deep cuttings and embankments or tunnels, and to test a new system of carriage invented by M. Bourget, civil engineer, for working it. A break placed under the carriage holds on to a third rail when the train stops, but when in motion the part which seizes on the rail opens by the effect of the onward movement, and closes, with great force, the moment the train ceases to go forward.

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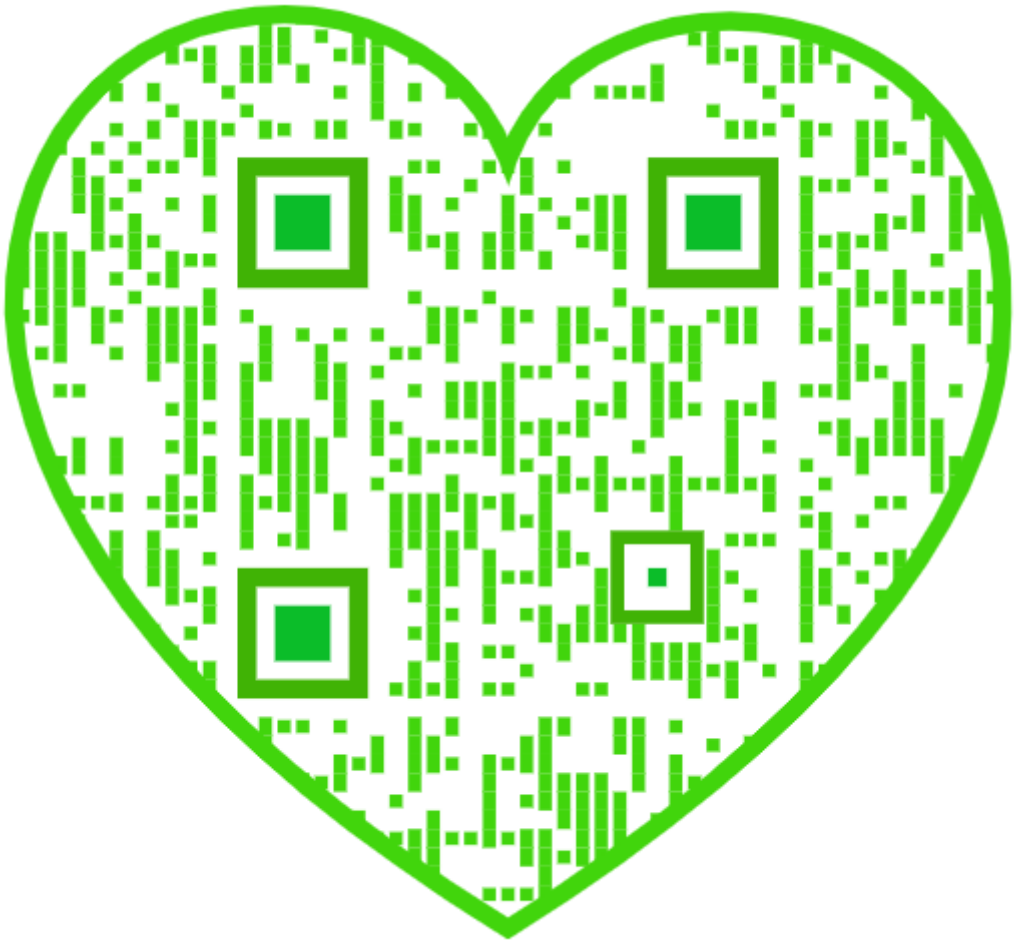

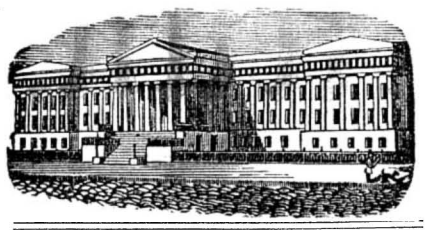

[Reported officially for the Scientific American

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING JANUARY 20, 1857.

GUIDES FOR SEWING MACHINES—Wm. B. Bishop, of Brooklyn, N. Y.: I am aware of the patent of H. W Dickinson, of May 15, 1855, wherein are used grooves in the under or bottom side of the pressure pad, for the purpose of stitching cords in work, and I therefore claim no part, device or thing, claimed by him.

I am also aware of the patent of John B. Nichols, Jan 30, 1835, for a binding attachment, which has a semi-elliptical groove, through which the binding passes, to double it around goods preparatory to sewing it thereon, and that said gauge is rendered adjustable, and I therefore claim nothing patented to him.

I claim an elongated pressure bar or foot having therein a flat groove to rec ive the edge of the center or button hole plait of shirt bosoms; and also a straight bearing surface forming the under and guiding surface for the other seams, or plaits of shirt bosoms, whereby I am enabled to stitch continuous straight seams in shirt bosoms, at a rapid speed, and perfectly straight, without any care or help from the operator—the whole being constructed, arranged and operating as set forth.

MAKING PAPER—John S. Blake, of Claremont, N. H.: I do not claim expelling or forcing the moisture from the pulp, by means of atmospheric pressure, irrespective of the means employed for effecting that purpose as herein described:

I claim, first, the employment or use of the pump I, vacuum chamber, f, and vacuum chest C, provided with the two compartments, a b, and communicating with the pipes, D G, by means of the cocks, e d, the parts being arranged, substantially as shown and described, for the purpose set forth.

Second, I claim the air and water trunk or reservoir, F, provided with the pipe, K, and communicating with the external pipe, L, as shown the reservoir communicating by means of a pipe, O, with the pipes, PP, having the tubes, i j, connected to them—the whole being arranged, substantially as described, for the purpose of trimming the edges of the paper or pulp; and I further claim trimming the edges of the pulp by means either of air or steam, when ejected through tubes, i j, arranged as shown.

Third, I claim the pipe, Q, with the tubes, K, attached and arranged as shown for the purpose of discharging the margin or strips of pulp from the wire cloth apron E.

Fourth, I claim the curved rod, W, with the rollers, s s, placed on it, the roller, s, being connected with the springs, t, and arranged as shown and described—whereby the felt upon S is stretched or distended, transversely, and also guided, or properly retained in position as it operates.

Fifth, I claim the cylinder U, in combination with the wet press cylinders T T, when the speed of the cylinder U, and cylinders T T is made variable for the purpose of stretching or distending the apron S, longitudinally as herein described.

Several very valuable improvements are embraced in this invention; but it would not be possible to convey a clear idea of these without engravings. They embrace a superior method of trimming the edges of the paper cut from the pulp, the proper discharging of the strips cut from it, and the keeping of the felt apron that conveys the paper to the pressure cylinder properly distended, to prevent creasing the paper, so as not only to improve the quality of the paper, but to prevent considerable waste now involved in its manufacture.

FORMING BATS FOR BELTING—John H. Bloodgood, of New York, N. Y.: The combination of the rollers B and C, with the vibrating drum A, in the manner and for the purpose described.

I also claim the combination of the rollers B and C, with the vibrating drum A, and the roller T, substantially, in the manner and for the purpose specified.

ENTRE VENT WATER WHEEL—E. G. Cushing, of Durden, N. Y.: I do not claim any particular shaped bucket, as I am of the opinion that one stated curve is not adapted to all heads with equal results.

But I claim making the bucket with a back of such a curve that it forms a space of regular contraction from the outside to the inside of the wheel.

Second, I claim hanging the buckets combined with a spring, in such a manner that the discharge orifice is regulated by the quantity of water let into the scroll, and the amount of power required, and closing together when the gate is shut.

ARTIFICIAL TEETH—Alfred A. Blandy, of Baltimore, Md.: I claim constructing artificial teeth with a hole, a, passing vertically through them, for the reception of the molten metal, and with a neck, b, and projecting sides in the manner and for the purposes set forth,

SAWING MACHINE—Geo. Gregg, of Lowes, Mill, Va. I do not claim any of the parts separately; but claim the whole when constructed and operated as set forth.

SEWING MACHINES—Elias Howe, Jr., of Brooklyn, N. Y. Patented in England, July 26, 1848. I claim drawing the thread through the cloth, by means of a finger, or its equivalent acting in connection with mechanism which passes the needle through the cloth, substantially as set forth.

STEAM PRESSURE GAUGES—E. G. Allen, of Boston, Mass., Assignor to Henry O. Allen, of Boston, aforesaid: I am aware that the use of elastic bags or capsules, in steam gauges, is old. It is seen in the rejected applications for patents of J. Lowe, Oct 17, 1851, and R Lapham, Aug 2, 1855; I therefore distinctly disclaim the use of an impervious bag or capsule composed of rubber or other pliable material.

But the employment of a metallic helical spring dome D, in connection with a capsule in steam gauges, forms an important and highly valuable improvement, and therefore disclaiming the use of springs in steam gauges, unless constituting a dome, D, and disclaiming every part of my device described, which is seen in any other steam gauge or analogous instrument.

I claim the helical dome, D, constructed,, arranged and operating in the manner and or the purposes substantially as described.

This guage is constructed with a helical spring, wholly or partly dome shaped, combined with a capsule of vulcanized India rubber, lining its interior or covering its exterior in such a manner that the spring is acted upon to extend or contract it by the differential pressure, between the steam and the atmosphere, the capsule serving as an impervious medium through which the differential pressure acts upon the spring which also sustains the capsule. The spring is connected with an index. It is stated to be an excellent improvement.

DOUBLE PILE CARPETS AND RUGS—John Goulding, of Worcester, Mass.: The fabric made or woven in the manner described; that is to say, crossing the top ground warp once only for two shoots of binding filling, one of which passes through and binds the pile warps and crossing the ground warp of the bottom fabric once only for four shoots of the binding filling, three of which pass through and bind the pile warps.

TREATING PHOTOGRAPHIC PICTURES—John Bishop Hall, of New York, N. Y.: I claim producing in pictures to be seen by direct light, a high artistic and stereoscopic effect, by combining with a white light or reflecting back ground or its equivalent, two or more identical pictures of the same subject, rendered more or less transparent, and executed on, or attached to plates of glass, in the manner substantially as set forth.

SEWING MACHINES—James E. A. Gibbs, of Mill Point, Va.: I claim making the chain stitch with a vibrating needle in combination with a stationary hook.

GRAIN SEPARATORS—Geo. Heberling, of Quincy, Ill.: I distinctly disclaim the invention of the separate devices described, as no one of them is new; but—

I claim the arrangement in a grain-cleaning machine of the plate, C, armed with teeth, d, and rubbers, e, the conical cylinder, D, with beaters and fans, F and G, attached chute or rim, M, plate, N, tubes b, and fan H—all constructed and operated, substantially in the manner set forth.

DIE FOR MAKING SPIKES—E, T. Henry, of Scranton, Pa.: I claim the lip C, formed at the point end of the groove, a, in the die A, substantially as shown for the purpose specified.

By forming a cutting edge at the point end of the die, as embraced in this invention, the spike machine of A. M. George, which was very defective, is converted into a most excellent machine for making railroad spikes.

HARVESTERS—M. G. Hubbard, of Penn Yan, N. Y.: I claim the combined cutting standard and inclined track clearer, when constructed and operating, substantially in the manner and for the purpose set forth.

I also claim hinging the cutting standard and track clearer forward of the finger bar, and near the front end of the shoe, and supporting the same against lateral pressure by means of the fulcrum post, b, as above specified.

CUTTERS FOR HARVESTERS—M. G. Hubhard, of Penn Yan, N. Y.: I do not claim forming the edges of cutters, by bending a plate of steel at its edge, and thus making an offset for the cutting edge—for this has before been done by Hazzard Knowles many years since.

I claim the cutter when formed in one piece, as seen in figure 2, constructed substantially as and for the purposes set forth.

PARING APPLES—Jared O. M. Ingersoll, of Ithaca, N. Y.: I do not claim the untomantic movement of the knife, or the various devices connected therewith, which are in common use, but confine myself to this specific claim, viz.:—

The peculiar form of the rod M, operated by pins on the face of the wheel G, in connection with the transverse bar P, arranged and operated, substantially as described.

BLAST FURNACE—Wm. Kelly, of Eddyville, Ky.: I do not claim blowing blasts of air into a liquid mass of iron, so as to refine it, as that is a well known process. Nor do I now claim, in the process to refine the iron separate and apart from fuel, as the iron, when being so worked, as above described in a blast furnace, has a large body of fuel to cover it, in a manner substantially as in a finery fire:

I claim the combination of the hearth of a blast furnace with the auxiliary tuyeres, B B and C, for delivering a blast of air into the fluid iron in said hearth; the whole constructed and operating in the manner and for the purpose specified.

HARVESTERS—Pells Manny, of Waddams Grove, Ill.: I claim as connecting the leading board, D, to the main frame, A, by means of the curved elastic shoe, C, rigidly attached at its front, to the leading board, and at its back to the under side of the main frame, by joint, C, in rear of the finger bar, and in front of the driving wheel, when said leading board serves to carry the fulcrum of the seat lever, F, by which the front of the mainframe is raised and lowered, substantially in the manner specified.

And I further claim the combination and arrangement for operation together of the seat lever, F, and foot lever, or treadle, E, essentially as set forth for the purposes described.

BRIDGES—D. C. McCallum, of Owego, N. Y.: I claim is so combining the arch brace with the arched cord or beam, the top horizontal surface of the abutment, or pier, and the lower chord, or tie, by means of the iron shoe and tension rods, as that the thrust of the arched chord shall be thrown down upon the abutment and any deflection in the lower chord be counteracted by an upward force at each end of the tension rods, substantially as described.

I also claim the method of lengthening or shortening the braces of a bridge truss or girder by which the truss may be elevated, or depressed, as required by means of the yoke, a, the plate, b, on the end of the brace, and the straining pieces, c c, with their nuts, d, substantially in the manner described.

HYDRANT—James G. Morgan, of Brooklyn, N. Y.; I am aware that hydrants have been constructed with cisterns to receive and retain the water at the discharge pipe, at a point below the surface of the ground where it will not be frozen: and that they have been provided with flexible and metal pistons, or valves to force the water again into the discharge pipe when the cock is about to be opened, and to receive the water from the discharge pipe when the cock is closed

I am also aware that air chambers have been applied to discharge pipes to break the force of the water, and maintain a constant stream; I, therefore, do not broadly claim such as my invention.

I am not aware that air chambers have been applied to hydrants, in such a manner as to admit of being compressed, and thereby forcing the water from the cistern into the discharge pipe, and by releasing them from the compression, allowing the water in the discharge pipe to run back into the cistern, and the air in the air chamber to fill the discharge pipe: whereby the machinery and cock can be placed above the ground convenient to access, and whereby the flexible air chamber, (which takes the place of the flexible valve or metal pistons, used by others,) is subject to no greater leakage pressure, than what is due from the height of water in the discharge pipe above the cistern.

I claim the combination of a cistern to receive and retain the waste water of a hydrant with one or more air or gas chamber, or chambers, arranged in such a manner that by compressing the air chamber, the air therein will be forced into the cistern, thereby forcing the water in the cistern into the discharge pipe, and by releasing the air chamber from such compression, the water in the discharge pipe will run into the cistern. Nor do I limit my claim to a flexible air chamber, as I consider a piston and cylinder a mechanical equivalent.

I also claim the peculiar method of compressing and releasing the flexible air chamber, in connection with the opening and closing of the cock, substantially as described.

BRICK MACHINES—B. F. Nave, of Roanoke, Ind.: I claim the peculiar manner of operating the said gauge, T, by means of bent levers, U U, in combination with cross cross bars, V, and shields, W, when the described parts are constructed and arranged for joint operation in the manner and for the purposes set forth.

HOSE COUPLING—Lodner D. Phillips, of Chicago, Ill. I claim the combination of the sections, a a, of the hose coupling, (having conical tubes, b b, on the exterior ends thereof,) with the conical sleeves, d d, as herein described and for the purposes set forth.

REFLECTORS FOR VAULTS—Emil R. Pichler, of Boston, Mass.: I am aware that glass plates, with single corrugations have been used. I do not claim such plates.

But I claim the so arranging of the glass plates herein described in a frame or frames, as to have the appearance and effect of double corrugations, when said plates are backed by any reflecting material as set forth.

LAYING TOPS FOR CORDAGE MACHINES—Wm, Robinson, of Warsaw, N. Y., assignor to Amenzo W. Beardsley and Wm. Robinson aforesaid: I claim, in laying tops, the use of a moveable cone, or its equivalent, so constructed and arranged, as to yield to the larger strand, or strands, and be pressed by them against the smaller strand or strands, substantially as described for the purposes set forth; whether said moveable cone is pressed against the strands by a spring screw, or otherwise.

MACHINE FOR BENDING TIMBER—James D. Sarven, of Maury County, Tenn.: I claim the bending frame, A, or its equivalent, arranged and operating substantially as described and for the purposes set forth.

I also claim, in combination therewith, the mechanism and arrangement described, or other equivalent devices for the purpose of operating the bending roller, I, or its equivalent, as specified—the whole being constructed and made to operate together, substantially as specified and for the purposes set forth.

I also claim, in combination with the bending frame, A, or its equivalent, the mechanism and arrangement described, or other equivalent devices for the purposes of bending timber in regular or irregular forms or curves, if the same is used in combination with a revolving mold, or mold operating or arranged in any other manner.

WINNOWING MACHINES—Jos. and Jas. Montgomery, of Baltimore, Md.: We claim the application of an adjustable sieve, M, above the auxiliary screen box, D, when arranged in combination therewith, in such a manner as to separate the large impurities before the grain is subjected to the action of the blast, in order to render said auxiliary screen-box more efficient in its action, and thereby allow it to be made as limited in extent as desirable, substantially as set forth.

FEEDING LUMBER LATERALLY IN SAWING MACHINES—Saml. R. Smith, of Florence, Mass.: I claim the combination of mechanism, by which the lateral adjustment of the log is affected, as described; such consisting of the spring, g, the stationary bearing roller in, or its equivalent, the lever, l, the toggles, n, i, the slide bar, f, the catch mechanism, T, the pinion, t, and the rack or racks applied to the carriage, V, substantially as described the whole being arranged and operating together essentially as specified.

And I also claim making the carriage or head block, V, movable, independently of the ways or frame, on which it is supported, and combining with said carriage and its movable rack, a lever and pawl, or an equivalent device. whereby said carriage may be moved towards the saw, by the hand of an attendant applied to the said lever.

COOKING STOVES—John G. Treadwell, of Albany, N. Y.: I claim in stoves with elevated ovens, having an escape flue below the elevated oven and none above it: the construction and arrangement of the damper, so that by turning it in one direction, it shall compel the flame and smoke to pass around the oven, and by turning it in another, may shut off the flame and smoke entirely from the oven, substantially as set forth and described.

BENDING SHEET METAL—John Wright, of Plantsville, Conn., Assignor to the S. Stow Manufacturing Company of same place: I disclaim every part of the machine described, which is seen in other analogous machines; but I claim the plate, D, when arranged and employed in the manner and for the purposes substantially set forth.

Machines hitherto employed for bending the edges of sheet metal to form locks bend the sheets at too great a distance from the edge where the lock is formed, because there is no support or device employed to prevent the sheet bending there. This invention obviates this defect, thereby producing superior locks of sheet metal.

ROOFING CURRENT—R. H. Smith, of Cincinnati, O.: I do not claim any or either of the above mentioned ingredients when used of themselves, or when combined with each other, broadly.

But I claim a cement, formed by materials prepared in the manner and in the proportions set forth, whereby a cement may be made and applied to roofing and other purposes, without the aid of fire to render it fluid, and by which the offensive smell, arising from the use of coal, tar, &c., is neutralized, as described.

MAKING CORD—Re-issue—Wm. E. Nichols, of East Haddam, Conn.—Patented Dec. 11, 1849: I claim, first twisting or controlling the twist of the strands, while the main frame is revolving to lay them into cord, by causing an even faced wheel attached concentrically to, and revolving with the bobbin frame to travel over a fixed and smooth surface—friction causing the frame to revolve.

Second, Revolving the bobbin frames on their own axes, to twist the strands, at the same time that they are carried around a common center, to twist the cord, by rolling them on the surface of a stationary annular inclined track, towards the inner or outer periphery of which they can be adjusted to run, so as to vary the relative twist of the strands and cord. substantially as herein set forth.

But I make no claim to the mere twining of the bobbin frames. by friction, by any of the devices usually employed for similar purposes.

Third, I claim the construction and arrangement of the central stem or spindle of the bobbin frame, operating substantially as herein set forth, whereby the yarns are collectively subjected to progressively increasing tension and twist, from commencement to the end of the process of laying them into the strand, whereby the latter is rendered smooth and regular in its figure, and uniform density and strength, and subjected to uniform tension, while being laid into the cord.

HARVESTING MACHINES—Additional Improvement—Robert J. Morrison, of Richmond, Ind.: I claim in addition to the claim heretofore granted to me, 16th Dec., 1856 allowing the roller, c, to come against an elastic or yielding stop, when the machine returns to its position, after passing any inequality in the ground, for the purpose of saving the machine from sudden jars, as set forth.

Quartz—Solid and Liquid.

Quartz is pure silica, and in its purest condition, in the form of white sand or rock crystal, is extensively employed for manufacturing crystal wares and the finest qualities of glass. It is a constituent of many rocks, and composes most of the pebbles of gravel beds. There is no mineral which appears in so many forms and colors. It is insoluble in sulphuric, nitric, and hydrochloric acid, hence the great value of glass vessels, in chemistry, for containing these acids; it has no cleavage, and is a very refractory, not melting in the heat obtained with the blow-pipe.

Although it resists the action of intense heat to reduce it to a liquid state, yet it is a fact, and a most useful one to scientific men, that by combining it with an alkali, it will melt like wax, and can be formed into threads fine as those of the spider's web, and into any form whatever. By mixing quartz with soda or potash, it will melt in a furnace and become glass. If too much alkali is combined with quartz in the manufacture of glass, the surface of the glass will often appear cloudy, by the excess of the alkali in the glass attracting moisture.

Although quartz is not acted upon by the strongest nitric acid, nor melted by the common heat of the blow-pipe, yet it can be dissolved in a solution of a common salt.

Silica is an acid, just as much so as the oil of vitriol. It is composed of a base and oxygen ($Si. O.^3$); and sulphuric acid is composed of a base, sulphur, and oxygen ($S. O^3$) in the same proportions. In combining with an alkali like soda, therefore, it forms a neutral salt.

In our last number we illustrated a method of manufacturing the silicate of soda—quartz reduced to a liquid condition—by caustic soda under a high pressure of steam. The application of this vehicle or agent to the arts in the manufacture of artificial stone, as a binding agent, and for coating the outside of walls, &c., is attracting considerable attention at present, and everything we published on the subject has been carefully perused.

Soluble quartz, or glass, as it is more commonly termed, can never be rendered useful in the arts unless it can be converted into neutral insoluble salt, composed of equal parts of silica and soda. Common soluble or liquid quartz contains an excess of alkali three times the quantity of silica; this is the reason why it is soluble in water. Why is common liquid quartz unsuited to cover or coat the surface of walls, or to form a cement for making artificial stone? It contains an excess of an alkaline salt, which is deliquescent, and which will attract moisture and crumble away, when exposed to the atmosphere, when combined in any artificial stone, or employed as a coating on the surface of any wall. As an agent to be used in the arts, as a wall coating or cement, it would be of great value could it be deprived of its deliquescent property. By the process of Mr. Ransome, described in our last Number, more silica is taken up, held in solution in the liquid than by the common process heretofore employed; hence, the liquid quartz which he obtains by it, is brought more near to the condition of an anti-deliquescent salt when dry; yet it is not perfectly non-deliquescent. By employing powdered flint in his artificial stone, then submitting it to a high heat, he has succeeded in making it non-deliquescent, but this application of it to the arts is very contracted. Something more is wanting, namely, the discovery of some cheap substance to combine with soluble glass, to render it a non-absorber of moisture, whether applied as a coating to outside walls where it cannot be dried by heat, to inside walls, or to the manufacture of artificial stones and other articles. We have no doubt but such a discovery will yet be made.

Monetary Intelligence.

For the benefit of our readers, as well as for our own benefit, we are induced to copy the following item from *Thompson's Bank Note Reporter* of the 24th inst., in regard to banks whose bills are discredited in this city:

"It was our intention to have given the circulation and securities of the Illinois and Indiana Banks that have discredited, but the storm has prevented our doing so this week. The troubles in Illinois and Indiana have been precipitated by the failure of the Gramercy Bank, which concern, or its backers, owned several other banks, which, of course, all went over like a row of bricks. The Gramercy Bank owners, we see, are at the head of one of the branches of the Bank of the State of Indiana.

The discredited banks, as far as we are posted, are:

Gramercy Bank, Lafayette, Ind.
Shawnee Bank, Attica, Ind.
People's Bank, Carmi, Ill.
Stock Security Bank, Danville, Ill.
Prairie State Bank, Washington, Ill.
Rushville Bank, Rushville, Ill.

The Exchange Bank, Bangor, Me., has gone into the hands of Receiver—"Tomb of the Capulets."

The people of Gordon County, Geo., have resolved, in public meeting, that they will not receive as money any of the following wild cat issues in Georgia:—Bank of Columbus; Bank of Middle Georgia, at Macon; Cherokee Insurance and Banking Co., Dalton; Interior Bank, Griffin; Manufacturers' Bank, Macon; Merchants' Bank, Macon; Southern Bank, Bainbridge; nor any other that are not bankable at the city of Augusta or Savannah."

Being in daily receipt from our patrons of bank bills from every State in the Union, we publish the above list of banks whose bills are unsaleable in this city, that our friends may save themselves the trouble of remitting them to this market, for such as we receive we shall be obliged to return to the sender until an agency is opened here for their redemption at the usual discount.

Liquid manuring having been very successful in 1856, in the practice of some farmers in England, the system will be greatly extended during the next season.

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To Prevent Oscillation in Locomotives.

MESSRS. EDITORS—I perceive in the SCIENTIFIC AMERICAN for January 10th, 1857, an article in relation to the oscillation cillation of locomotives. Deeming the subject as one deserving the serious attention of our locomotive builders and others interested in the performance of the steam engine, I beg to submit the following experience, gained from experiments made in order to discover the cause, effect, and means for counteracting this existing evil. The result conclusively determines two forms of oscillation, fore and aft, and lurching. The first is due to the inertia of the reciprocating masses of the pistons, piston rods, and cross-heads, having to be encountered and annihilated at every return of the stroke, the absolute counteraction of which should be a proportional weight moving in adverse directions to the motion of the engines may be made in the form of a block, working in slides, and driven by the return crank, producing a correcting antagonistic force, completely neutralizing in its effect. The second form of oscillation is produced by the eccentric swinging of the cranks, and merely require to be balanced by equivalent weights in the driving-wheels.

An engine correctly balanced in the aforesaid manner will be found to run with astonishing ease and steadiness of motion, require at least 25 per cent. less fuel, and keep in running order an infinitely longer time.

WM. M. HENDERSON.

Union Works, Baltimore, Jan., 1857.

The Up-and-Down Saw Yet.

MESSRS. EDITORS—The circular saw has made so much noise within the past year or two, in the lumbering world, that an inexperienced person might be led to conclude that it is the only saw worth having for manufacturing lumber economically and successfully. The old "up-and-down saw" does not envy the "circular," yet it does not wish to be left in the shade, as though it were destitute of merit, and it will not stop to inquire into the claims of the "circular" at this time, but would simply state that it has cut 2,000,000 feet of pine lumber in one year, and that it can do it again. And further, that its lumber will bring from 10 to 20 per cent. more in market than the same amount of circular lumber will; and that if all the bad stuff made by each, during that time, were shown at the same time, the "circular" would be very apt to be left in the shade. It cuts speedily, but it will not endure. A single vertical saw has cut 1000 feet of pine in an hour. The circular saw may do more than that, but it will not be as smooth. The difficulty of finding good circular sawyers makes its superiority doubtful. A vertical saw has cut 10,000 feet in 24 hours, week in and week out, which can be easily verified. The whole subject of saw mills is not yet so fully and generally understood as it should be. S. E. P.

Pa.

Death of Dr. Ure.

This distinguished and venerable man of science died on the 2nd inst., in London, at the age of eighty-nine years. He is well known by his writings in the United States, especially by his Dictionary of Arts Science, and Mining, which has no equal in any language.

His first work was a Dictionary of Chemistry, published in Glasgow, Scotland, when he was Professor of Chemistry in the Ander onian Institute, where he delivered his chem ical lectures to the working men of Glasgow. The last thirty years of his life have been spent in London. He was a popular lecturer and writer.

On the Peshakame river, in the Lake Superior region, there is a ridge of specular oxyd of iron—nearly pure—113 feet high, 100 feet wide, and extending miles in length

Tin ores are becoming scarcer, and the price of this metal has been rising steadily during the past year.

Inventors have been very active in England during 1856; 3,000 patents having been issued to them.

Treating Metallic Ores.

Chevalier G. Hahner, of Leghorn, in Tuscany, has invented a new process for treating metallic ores, which embrace chemical principles deserving the consideration of all mineralogists. The object of this invention is to decompose certain metallic oxyds, and especially the oxyd of copper, at a high temperature, in the presence of vapors of water and of silica, by means of alkaline chlorides, or other chlorides forming oxychlorides, or chlorides soluble in water—avoiding the loss of metal from the formation of free soda, or soda combined with silica, by the addition of an acid; and in separating the metals and other substances contained in the solutions. To form the oxyds, the ore is submitted to roasting, either in the open air or in kilns or furnaces, for the purpose of expelling sulphur, arsenic, and other volatile substances, and rendering the ore more friable. If the metallic rock contains calcareous substances, it must be burnt in a similar manner to lime, and dissolved in water; the oxyds of the ore will deposit at the bottom of the vessel in which the lime has been dissolved and driven off. Oxydized and other ores which do not contain sulphur or other mineralizing substances, only require to be brought to a red heat. The ores, treated as described, are then reduced to powder by the ordinary means, and again roasted in a reverberatory furnace—a small quantity of coke, charcoal, coal dust, or other combustible being added to facilitate the operation. To decompose metallic oxyds obtained as described, and also other oxyds, the red hot ore remaining in the furnace, after being completely roasted, is mixed with an alkaline chloride (chloride of sodium being preferred on account of its low price), in the proportion of about two parts, by weight (more or less according to the nature of the ore), of chloride for each part, by weight, of metal to be extracted from the ore. To obtain a more perfect mixture, an equal weight of ore already roasted is intimately mixed with the chloride, previous to its introduction into the furnace, and then moistened if dry. The moistened chloride, or mixture of chloride and roasted ore, ought then to be incorporated as intimately as possible with the red hot ore in the furnace, and kept in a continual movement and at a red heat, until the smell of muriatic acid becomes less perceptible, and the ore commences to adhere to the workmen's tools; the ore is then withdrawn from the furnace, and a fresh charge added. It is advantageous to leave the red hot ore thus withdrawn for some time, in heaps, which renders the process still more perfect. If the ore contains no silica, it is requisite to add about ten per cent. of this substance. The ores, treated as described, are then submitted in a hot state, if possible, to lixiviation. The inventor adds to the water employed for the lixiviation of the roasted ore, about five parts, by weight (more or less, according to the nature of the ore), of sulphuric, muriatic, or other acid, to one thousand parts, by weight, of ore, to render more soluble the oxychlorides or chlorides, and to decompose the free soda, silicates of soda, &c., which may have been formed during the roasting, and which would cause a great loss of metal. The vessels in which the lixiviation is performed may be of wood, and of any form and dimensions, according to circumstances; they should be furnished with an ordinary filter, to allow the water to run off freely. The precipitation and purification of the metals contained in the solution can be affected by the usual process. The copper may be precipitated by common ashes, lime water, and caustic water; and the products obtained may be used in the manufacture of different colors, salts, or reduced to the metallic state in ordinary furnaces. The copper may also be precipitated in the state of arsenite or arseniate of copper for the formation of green French paint by means of a solution of ars enite or arseniate of potash.

The machine shop at Hornellsville, N. Y., belonging to the New York and Erie Railroad, was burned down on the 20th inst. One locomotive was burned, and all the machin ery. In all likelihood, this conflagration was caused by carelessness.

The Tower of Babel.

The *Boston Traveler* contains a letter from Beyrout, giving an account of an expedition under M. Place, the French Consul at Mosul, to the plains of Arabella, and his discovery of the veritable "Tower of Babel," which the Bible tells us was built not long after the Deluge, and was intended by the Babylonians to be elevated so high, that if a second flood came they would be safe above its waters.

The account given of the tower discovered by M. Place is, that only two stories of it are all that remain, but these are so high as to be seen for sixty miles around. The material of its construction is brick, of a delicate yellow color. Many of the bricks are marked with inscriptions neatly executed. M. Place, it is stated, also discovered inscriptions on fillets of gold, silver, and copper, and a metal now unknown to moderns, resembling ivory in appearance,

Petrus Valensis, an Italian traveler, visited the ruins of Babylon in 1616, and describes a tower such as that said now to be re-discovered, but he believed it to be a tower built by one of the late Princes of Babylon, and not the famous old Tower of Babel, the building of which is recorded to have been the occasion of the confusion of tongues, and the source of the various languages of men.

Babylon was one of the wonders of the East. Its walls were 87 feet thick and 350 feet high, and were 60 miles in extent. The Tower or Temple of Belus stood in the middle of it, in which was a golden image of Baal, forty feet high. It was famous for the cultivation of the science of astronomy at an early date; the astronomers made their observations from the top of the high tower, in a very clear atmosphere. Alexander the Great took it; and Calisthenes, the philosopher, who accompanied him, states that astronomical records had been made in Babylon from 115 years after the Deluge.

The grandeur of the palaces and buildings, and the known wealth of old Babel, rendered it for a long period the center of Asiatic civilization and power. But its walls have crumbled, and for centuries the very Arab of the desert has shunned its ruins, because of the wild beasts that haunt there, and the numerous venomous serpents that make their abode in palaces, which were once the abode of kings.

Elastic Gums.

These gums are among the most important and generally useful, and although at present confined to two varieties, there is no reason why additions should not be made to the list, and investigation promoted to elicit the comparative value of others. The rapid progress of the submarine telegraph, setting aside other important commercial uses of gutta percha, loudly calls for fresh supplies. If no other purpose had been subserved by this Indian gum than that of encasing the telegraph wires, mankind would have reason to be eminently grateful to the discoverers.

India rubber is now applied to so many purposes that their mere enumeration would be tedious, and new applications of it are continually being made.

Boundless forests of the Serang tree are found upon the banks of the Amazon, and the exportation of this elastic gum from the mouth of the river is daily becoming a business of more and more value, extent, and importance.

Of substances which may be used as substitutes to some extent for india rubber and gutta percha, Professor Simonds mentions the inspissated juices of the wild and cultivated bread fruit trees, and the lola tree.

Various species of Indian fig trees, as *Ficus Radula, elliptica*, &c., also furnish portions of the elastic gum of commerce. *Vahea gummifera* likewise supplies india rubber. The *Urceola elastica*—which produces the Gintawan of the Malays—abounds on the islands of the Indian Archipelago. In Java it is called "bendud."

The concrete milky juice of the *Cryptostigeia grandiflora*—a handsome climber, common in the Madras Peninsula—has long been known to contain india rubber, but it has not yet been collected for the purposes of commerce, and it is doubtful if a sufficient quantity could be obtained to render it an article of trade.

Tne milk from the cow tree appears also to contain india rubber. On the river Demarara the Indians climb the rubber tree, tap the trunk, and as the gum exudes, rub it on their bodies till it assumes a sufficient consistency to be formed into balls.

Recent inquiry has shown that india rubber is furnished of good quality, by a large number of milky-juiced plants belonging to different families—*Sapotacea*, *Apocynaceæ*, and *Euphorbiaceæ*. In the East, Assam now furnishes large quantities of india rubber from *Ficus elastica*. Complaints are, however, made of the want of care in the preparation of it by the natives.

If the previous purifying of the gum be properly attended to—and in this process the whole art of manufacturing the perfectly elastic gum of commerce seems to exist—the gum should not, by any exposure to the atmosphere, be subject to the least degree of clamminess or viscidity; for if this important point be not fully attained, the article is of no use in the manufacture of those fine elastic threads which constitute its chief value.

Some large forest trees, belonging to the Sapotaceœ family, which abound at the foot of the Ghauts in India, furnish a valuable elastic gum, called by the Malays "pauchouthee," which bears a strong resemblance to gutta percha, both in external appearance and mechanical properties.

Gutta percha has been discovered in the British province of Mergui, and though not precisely identical with the gutta percha of commerce, it possesses all the valuable properties of that substance, including plasticity in hot water, and the power of insulating electric currents.

The tree from which the true gutta taban is produced (erroneously misnamed gutta percha, a gum yielded by a different tree), is one of the most common in the jungles of Johore and the Malay Peninsula. It is not found in the alluvial districts, but in undulating or hilly ground. There is a great uniformity in the size of the full grown tabans, which rise with perfectly straight trunks from sixty to eighty feet in height, and from two to three feet in diameter, the branches being few and small. The natives, after felling the tree, make an incision round it, from which the milk flows. This is repeated at distances of six to eighteen inches along the whole trunk. It appears that the taban, or milky juice, will not flow freely like india rubber, but rapidly concretes. Its appearance in this state, before being boiled, is very different from that of the article as imported and shipped. It has a dry, ragged look, resembling shreds of bark, and instead of being dense and tough, is light, and possesses so little cohesion that it is easily torn to pieces.

Various statements are made as to the produce of each tree, which is somewhat surprising, considering the uniform size of the trees. It takes twenty trees to produce one picul of 133 lbs., and as the exports of gutta percha, from the commencement of the trade up to the close of 1853, amounted to 3,107 tons, it follows that upwards of one million trees must have been destroyed to obtain that quantity in nine years. The natives, however, do not appear to be under any apprehension that the trees will be extirpated, and smile at the probability when suggested; for it is only trees arrived at their full growth, or at least at a very considerable age, that repay the labor of felling them and extracting the gutta; and those of all inferior ages which are therefore left untouched, will, it is supposed, keep np the race.

The collection of the gutta has widely extended, embracing now the Johore Archipelago, Sumatra, Borneo and Java. Unfortunately, the quality has deteriorated by the admixture of other inferior gums, the products of different trees, which are often used to adulterate the taban.

Steam Fire Engines.

In Cincinnati they have eight steam fire engines in service, and no other kind. They have already saved millions of property, and delivered the inhabitants from serious appre hensions of a wide-spread fire.

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New Inventions.

New Process of Vinification.

It has been discovered by analyzation that the grape substances giving out color, taste, bouquet, and flavor to wine,—viz., tartar, tannin, essential oil, and coloring matter—constitute only 1 per cent. of its composition, the remaining 99 per cent. consisting merely of sugar and water. It is this 1 per cent. alone which makes wine, distinguishes it from all other liquids, and bestows its different valuable qualities.

It appears that the above-mentioned component parts—especially that which is most precious, the essential oil—are only one-fourth absorbed by the usual process of fermentation; there is, therefore, left undeveloped at the bottom of the fermentating tuns or vats 75 per cent. of flavor, &c., which, if saturated in a solution of refined sugar and water, will give one-third of its unexhausted properties, which is sufficient to produce wine of a better quality than that derived from the natural must. This operation may be three times repeated with the same result; and, even if tried a fourth time, will yield sufficient flavor to make a small description of vinous liquid. This discovery is due to the French chemists, who, on account of defective vintages, have deemed it worthy to investigate the subject.

Miniature Toy Balloons.

During the recent holidays, small balloons made of goldbeater's parchment colored red, and filled with hydrogen gas, have been the delightful gift toys of the season to the infantile world in Paris. Each is made with a string attached to it, by which it is held in the hand of a child, and when it escapes, up it mounts, and sails along the ceiling of the nursery or parlor, a wonder to the youngsters.

Such toys might be successfully introduced into our cities. The first of them made in Paris was by a poor mechanic as a desperate effort to raise a few francs; they took with the public, and it is asserted that he realized 300,000 francs profit, from the great number he made to fill the orders of the toy dealers.

It is thus, by speculative efforts of this kind, that many enterprising men make fortunes.—Those who never venture never win, in inventions, commerce, or literature.

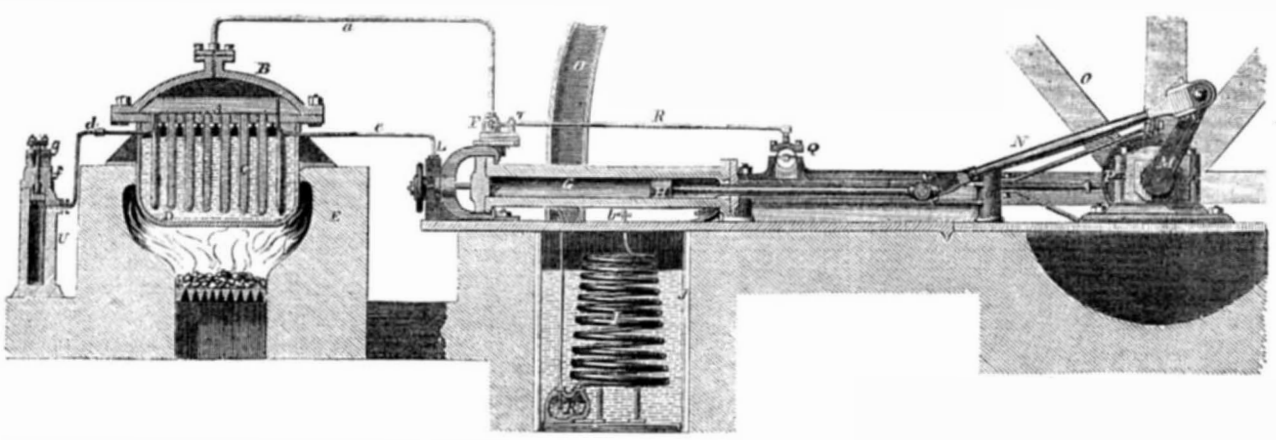
Carbonic Acid Gas Engine.

The accompanying figure is a longitudinal vertical section of an engine designed to be propelled by carbonic acid gas, as a substitute for steam. The inventor is J. Ghilliano, of Marseilles, France.

The main feature of this invention is the generation of the carbonic acid gas or vapor by the aid of a water-bath, whereby a uniform heat is sustained, which keeps the vapor at a uniform or nearly uniform pressure. The generator consists of a strong cast-iron vessel, and into the bottom of this vessel is fitted a number of vertical tubes closed at their lower extremities, but opening at the top into the interior of the vessel. Liquid carbonic acid is poured into these tubes so as to fill them, and cover the bottom of the vessel. The hot water bath or boiler is a cast-iron vessel, filled or nearly filled with water, and it is placed over a furnace of the ordinary construction. This bath or boiler is open to the atmosphere, and the water it contains surrounds the tubes already mentioned. When the water is heated, the generation of carbonic acid gas commences, and as long as the water is kept at the boiling point, the heat will continue to be uniform, and the gas will exert an unvarying pressure. This vapor may now be employed as a substitute for steam in generating motion, and after passing into the cylinder of the engine, and there exerting its expansive force upon the under side of the piston, it escapes through an exhaust port into a worm pipe, in a vessel of cold water, where it is condensed, and flows into a well or chamber in the form of a liquid. This liquid carbonic acid is then, by a feed pump, supplied again to the generator. The generator may also be supplied at will from a vessel containing liquid carbonic acid by means of a pipe communicating therefrom to the generator.

The generator consists of a cast-iron plate, A, surmounted by a cast-iron curved cover, B, secured thereto by bolts. The plate, A, is fitted with a number of tubes, C, which are closed at their lower ends, and open at their upper extremities into the space formed by the curved cover, B, and plate, A. These tubes are all filled with liquefied carbonic acid, which covers the surface of the plate, A. The whole apparatus is placed over the boiler, D, which is open to the atmosphere, and is filled or partially filled, with water or other suitable fluid, in which the tubes, C, are partially immersed. The whole is placed over a furnace, E, the heat derived from which is just sufficient to maintain the water or other fluid in the boiler at boiling point. The liquid carbonic acid contained in the tubes, C, is converted into a powerfully elastic vapor, which is disengaged into the upper vessel, B, at a temperature of 212° Fah., the boiling point of water.

FRENCH CARBONIC ACID GAS ENGINE.



the vapor is alternately conducted first to one cylinder and then to the other, pushing forward first one piston and then the other. At the return stroke of each piston, the gas escapes by an exit port, as in an ordinary steam engine, and is conducted by a pipe, *b*, to the condenser, where its elastic force is destroyed, and it is reconverted into a liquid.

The condenser consists of a serpentine tube, I, completely immersed in a cold liquid contained in the vessel, J. The condensed carbonic acid thus produced flows into the closed vessel or well, K, from which it is pumped up and forced back again into the generator by means of the feed pump, L, and pipe, *c*. The generator is furnished also with a pipe, *d*, communicating with a liquefying apparatus consisting of an iron vessel, U, closed by a screwed cover *f*, of the same material. This cover, which is itself hollow, is closed by the gland, *g*, also screwed in. Liquid carbonic acid can by these means be conveyed from the liquefying apparatus, whenever required, to the generator.

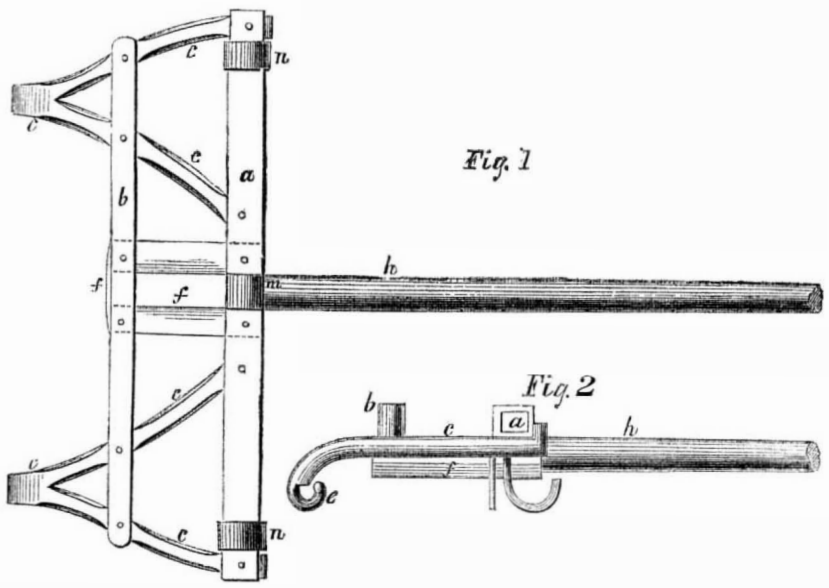
The chamber, U, contains carbonate of soda, and the hollow cover contains sulphuric acid, which acid flows into the chamber, U, and generates carbonic gas when the valve descends, its descent being caused by the vacuum in the tube, *d*. In order to produce this escape of gas into the tube, *d*, it is necessary that a valve in the tube shall be opened to allow of the passage of the gas into the generator, B. This valve is opened when the level of the acid in the generator, B, has fallen, and the pressure of the gas on the valve is reduced.

In order to prevent any escape of gas which might occur round the piston, the ends of the cylinder, G, are closed in a similar manner to the cylinders of hydraulic presses. This part of the cylinder is placed in communication with the worm, I, by means of a pipe, so that any gas that may escape round the piston is forced by it into the condenser. Each piston, H, transmits its movement to the crank shaft, M, by means of a connecting rod, N. The shaft, M, carries a fly-wheel, O, and an eccentric, P, which gives motion to the valve at F, and feed pump, L, by means of the intermediate rocking shaft, Q, to which are keyed levers attached to the pump rod and to the rod, R, which is connected to the bell crank lever actuating the slide valve.

The gas is conducted by means of the pipe *a*, to the valve chamber, F, communicating with two cylinders, G, which contain pistons, H. As it is extremely difficult to prevent an escape of the gas through the packing of the piston rod stuffing-box, an arrangement is adopted for allowing the gas to act only on one side of the piston; thus the effect is the same with two cylinders acting alternately as it would be with one cylinder of the ordinary construction.

In the machine represented in the figure, the foregoing is from the Glasgow *Practical Mechanics' Journal*. In 1823, Sir Humphrey Davy published a pamphlet on this subject setting forth the economy of carbonic acid gas as a mechanical agent, because, at the temperature of 32° Fah., the gas, when reduced to liquid, in its endeavor to assume the gaseous state again, exerts a pressure equal to 38 atmospheres on the square inch. Many attempts have been made to use it as a substitute for steam, but hitherto all have failed. This figure represents another attempt in the same direction, but it must prove a failure also. The reason why, we will tell our readers, to prevent any of them being misled by the project. Gases are elastic in proportion to their latent heat; the more elastic they are, the more heat must they have taken up to render them so; therefore, if steam is less elastic than carbonic acid gas, the sum of its sensible and latent heat is just so much less than that of carbonic acid gas. This is one reason. Another is: carbonic acid gas cannot be condensed into a liquid except under great pressure—very unlike steam in this respect—and this unfits it for the motive agent of an engine in comparison with steam.

IMPROVEMENT IN CARRIAGES.



The accompanying figures represent an improvement whereby a carriage can be readily adapted for one or two horses, by attaching a frame to the running gear, by clips, and providing sockets for the reception of a pole, and also thills.

Figure 1 is a top view of the swinging frame, with a pole attached to it; and fig. 2 is a side view of it; *a* and *b* are two cross-pieces of the frame, connected together by braces, *c c*, terminating in eyes, *e e*, by which the frame is attached to clips placed in the usual way on the front portion of the running gear of the carriage or vehicle.

There are sockets for the thills on the under side of the front bar, *a*, one at each side inside the swingle-tree loops *n n*, and one at *f*, at the middle for the pole, *h*. The thills, when the frame is for one horse, pass (one on each side) between the two angle sides of brace *c c*, and each is bolted to the back piece, *b*. A pole and a pair of thills are made and kept for this frame; the socket, *f*, for the pole, *h*, extends across the frame from *a* to *b*. and the pole is keyed in this socket by a common bolt. The swingle-trees are attached to the front bar either at *n* or *m*, as the case may be. When it is designed to use the carriage with a single horse, the pole *h*, is taken out, and each thill (a simple single shaft) is inserted in its socket and bolted to the back piece, *b*—its inner end being confined between the legs of the angle brace, *c*. This is a very simple, convenient and good improvement for rendering a wagon or carriage adaptable for one or two horses, and it can be applied to all common vehicles. A patent was granted for this invention to Noah Warlick, of Lafayette, Ala., on the 14th of October last.

More information may be obtained respecting it by addressing him by letter.

Dividing Machine.—The Diamond's Point.

We have received from J. C. Terry, of Springfield, Mass., a sample of minute marking on glass, accomplished by a machine which he has constructed. The sample is a rectangular piece of polished plate glass—a micrometer—marked with 100, 400, 1,000, and 2,000 lines to the inch by his machine, and with a diamond point which has been used for more than 20 years. He has no doubt, he says, "but one may be made to mark five, and even ten thousand lines to the inch." When the micrometer is held obliquely to an artificial light, prismatic colors are reflected, which proves that although the lines cut by the diamond are so exceedingly minute as scarcely to be detected by the naked eye, yet they are sufficiently deep to form right-angled prisms. The machine of Mr. Terry must be constructed with great care, skill, and delicacy, to execute such minute marking.

More miles of railroad have been built during 1856 than in any previous years, viz., 3,407 miles.

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Scientific American.

NEW YORK, JANUARY 31, 1857.

Fusible Plugs for Steam Boilers.

The article on this subject which appeared in our columns (page 117) on the 20th ult., has attracted the attention of our steamboat engineers generally, and since then we have received a number of communications on the subject. As the law for the better protection of life on steam vessels compels the owners to employ fusible plugs in all their steam boilers, and as these fusible plugs are provided by Government, and for which Inspectors charge the sum of one dollar per pound, it is certainly of vast consequence that these plugs should perform their appropriate functions correctly.

Do they answer the purpose for which they are provided by law—are they safety fusible plugs ? This is an important question. If they do not, they are *shams ;* they do more evil than good; for the very use of them for an object prescribed by law,which object they do not fulfill, is a public deception.

Thomas H. Borden, of New Orleans, a skillful and experienced Western steamboat engineer, informs us, in a letter, that he "doubts if fusible plugs can be constructed in such a manner as to be relied upon with any degree of safety. The pressure of the steam coming upon them totally destroys their fusibility." He refers us to the experiments of Cadwallader Evans, of Pittsburg, with fusible plugs, under various steam pressures, in which he demonstrated that they will not answer to prevent explosions. He believes that Mr. Evans' "Safety Guard" is a most useful instrument for preventing steam boiler explosions.

In a letter from L. N. Nutz, of St. Louis, Mo., he states that the Government fusible plugs have been denounced in a daily paper in that city, by one of the Steamboat Inspectors, who stated that they were unfit for the purpose for which they were employed—that they were not safety plugs. Mr. Nutz informs us that he has long used fusible plugs of an alloy which may always be trusted. An alloy of eight parts bismuth, five of lead, and three of tin, will fuse in boiling water ; by reducing the proportions of bismuth and tin, in this alloy, a plug can be made which will fuse at any temperature desired, according to the pressure of the steam in a boiler. These plugs contain no mercury, and he says they will not undergo any change unless heated beyond the fusible point. He has a safety tube in his boiler, in which he uses an alloy composed of these three metals, and it has always given the alarm, when the steam has risen to the extreme pressure for which the alloy is made. He also asserts, that such an alloy will always fuse when raised to the same temperature, no matter how often the experiment may be repeated. The Government fusible alloys have been complained of by engineers as not being uniform in their effects ; if they melt at the correct temperature once, they do not do so a second time, consequently they are not reliable.

How to View Pictures.

Although the relief of solid objects (and distances as its representative) is best seen with two eyes, yet it is equally true that vision with one eye is superior to two for some purposes. In looking at an oil painting the surface of which is covered with varnish the figures and objects represented appear more distinctly when examined with one eye only. The varnish reflects the light which falls upon it to each eye—when both are open—and from objects in various parts of the room, therefore, by closing one eye, a quantity of the reflected light is shut out, and the mind then contemplates the picture with less disturbance. All painters (artists) are well aware of this fact, hence they generally examine oil paintings under a bright light by monocular vision. The pictures in a room or gallery having side lights, should always be viewed with one eye closed, the open one being that which is best shaded from the light. The light which falls in greatest quantity on any one eye, diminishes its sensibility to the red rays, and gives a false coloring to the pictures.

A photographic picture is seen more perfectly with one than with two eyes; it being a plane surface, the one eye is not so much troubled in adjusting the pupil while examining the different points; and, besides, as it cannot appreciate distance so well as two eyes, the light and shadow, although on a plane surface, actually appear like a solid picture.

There are three kinds of relief when we look at a picture on a plane surface, such as a daguerreotype, viz., ocular, with two eyes, monocular, with one, and binocular, when two pictures of the same figure are combined, as in the stereoscope. If we look at any one of two stereoscope pictures with two eyes it has very little relief; if we look at it with one eye, either in or out of the stereoscope, the relief is greater than with two eyes; but when we look at the two pictures combined in the stereoscope, the relief is perfect, giving an accurate representation of the original, if the two pictures have been taken at the proper angle for two eyes, at about three inches apart.

The New Patent Bill.

In another part of this number of our journal we publish entire the proposed law for the amendments of the Patent Laws, which is now before Congress.

The main features of this Bill were discussed by us in our issue of Jan. 3rd.

We are glad to notice that the information we had then received concerning the proposed enactment, viz., that it contained no provisions for a radical change in the Patent Laws, but was chiefly designed to promote *the better administration af the present system*—is fully confirmed by the document itself.

Some of its provisions appear, at present, objectionable to us. These points we have before discussed, and it is unnecessary again to repeat them. We should be better pleased to see the Bill pass that we presented to the public on page 189, Vol. 11 Scientific American, but we are not among those who refuse to take part of a loaf because a whole one cannot be had.

Whatever may be the defects of this Bill, it is but fair to admit that, regarded as a whole, it is *good.* Its passage will, perhaps, be productive of some evils that at present do not exist. On the other hand, many serious evils that are now daily felt, will be abated and other highly important benefits will ensue. We commend the document in question to the careful examination of all our readers.

Mineral Rods.—Searching for Precious Metals.

We have had frequent inquiries respecting the existance of what is called a "mineral rod," said to have the quality of detecting metals—especially gold and silver—in the earth, under the surface of the soil. To such inquiries we have uniformly returned the answer that "we were totally unacquainted with the existence of such rods" for discovering the precious metals. We have heard of persons who claimed the possession of knowledge to make and use such mineral rods, and thereby the power of discovering hidden treasures, but these claims we have treated with skepticism, because we are not acquainted with a single feature in science that would warrant us to treat them in any other manner.

That magnetic iron ores in the earth will attract a magnet is a well known fact, but neither gold nor silver ores in the earth so affect the magnet.

We do not pretend to an acquaintance with all knowledge, and it may be that there are many secrets of nature possessed by persons, who, for good reasons, keep such knowledge private; and it may be so with such an instrument as a "mineral rod." Until, however, we have positive demonstration that such an instrument will affect the objects claimed for it, we must deny the veracity of those claims.

The Connecticut State Agricultural Society, at its annual session, appointed a chemist, at a salary of $400 per annum, for the purpose of analyzing manures.

An American Inventor Shot in Paris.

Recent foreign papers contain an account of the death of Charles Morey, of Boston, Mass. He was shot by a sentry while standing at a window of Clichy Debtors' Prison, in Paris, on the 30th of last month. He was proprietor of Goodyear's patent for vulcanized India rubber for England and France, and had been imprisoned through some dispute between him and Mr. Goodyear, (who has also been residing for sometime in France,) with the merits of which we are not acquainted. Msrey was to have been discharged on the very day he was shot, the court having declared, after a tedious process, that his arrest had been illegal. The sentry stated that he had commanded Mr. Morey to depart from the window, this having been the orders in other prisons, and as he did not do so, he fired upon him. A letter in the London *Times* from an English prisoner says:—"This morning (30th Dec.) Charles Morey, an American gentleman, patentee of the vulcanized india rubber, was deliberately shot dead by a soldier of the 88th Regt. on guard, when standing with his hands in his pockets at one of the windows which are public to all the inmates. He had committed no infraction of the regulations; and these forbid the sentry carrying a loaded musket in the day time. The unfortunate victim, while in prison, was one of its most respected and honored inmates."

Mr. Morey was thirty-two years of age, and leaves a wife and family. On a few occasions he corresponded with the Scientific American, from Europe. He was the joint inventor with R. Johnson, of Boston, of a single thread sewing machine, illustrated on page 145 of our fourth volume—the first sewing machine illustrated and described in any publication in this country. He was the first person who publicly exhibited a sewing machine in this city, which was in 1848,] and by his enterprise and business tact, he first gave that public impulse to the importance of such machines, which has resulted in their great improvement and wide-spread use at the present day. The event is a painful calamity; he was cut off in the very vigor of health and manhood, suddenly and without a fault on his part, on the very day he was to be liberated from a lingering confinement; perhaps he was in reverie at the prison window, thinking joyfully of his anticipated liberty, when the ball of the stupid and brutal soldier struck him down a lifeless corpse !

Improvements in Molding Metals.

In the Scientific American of Jan. 3rd, we published an illustrated description of an improved method of molding metals, for which a patent had been obtained in England by J. Downie. We have received a letter from Geo. Peacock, of Canandaigua, N. Y., a practical molder of much experience, who claims to have invented the same improvement for molding pipes, and to have carried it into practice about eighteen months since, in the city of Cleveland, Ohio, in molding the water pipes for that city, which pipes were cast vertically. "His friends," he states, "strongly advised him, at that time, to make applications for a patent, but he thought the improvement one of those things so hard to protect by a patent, conceiving that by so doing he would make known to the public an idea, which was worth more than the mere mode of working it out."

We regret, for his own sake, that Mr. Peacock was governed by such reasons. This is not the age to keep improvements secret, as the best means of reaping personal benefit. Every man who invents an improvement should apply for a patent as soon as possible for, in all likelihood, if he endeavors to keep it secret for any length of time, some other person will invent the same thing, apply for a patent, and thereby acquire the means and authority to prevent the first but secret inventor from using his own invention. Mr. Peacock says, "should Mr. Downie apply for a patent here, I trust the Commissioner of Patents will be careful in the matter, and not grant anything that is known here."

If Mr. Downie applies for an American patent for his improvements in molding, as embraced in his English patent, the Commissioner will be likely to grant it, and the Courts will sustain it. The patent law does not recognize any secret invention; this question has been decided in our United States Courts. We know an inventor who, by the advice of injudicious friends, was prevented becoming a rich man, by keeping and working a valuable invention in secret, and not patenting it. It was afterwards patented by another person, who has made an immense sum of money by it; our correspondent, in our opinion, has neglected the advice of *judicious* friends, to his own great loss.

The Cold Weather.

The present has been the coldest weather in the United States, within the memory of man, and it has been distinguished for high winds and drifting snows, which have obstructed travel to an extent never before known since the introduction of railways. A severe snow storm commenced on Sunday the 18th, and extended over a very wide area, drifting the snow into such deep banks as to stop all travel for a number of days; indeed, we did not receive a mail from Washington for five days afterwards, and we have received but very few mails from any part of the country since then. Our correspondents, whose letters have been detained by the mails, will thus know the reason why they have not received answers.

Mr. Green Smith, of Peterboro, Madison county, N. Y., informs us by letter that the thermometer was 32° below zero in that place on the 18th; at Watertown, N. Y., it was 40° below zero; at Albany, N. Y., it was 21° at New York, 4°. The winter of 1856 was thought to be very cold in this city, but the coldest day of that year—9th January—was only 5° below zero, while on the morning of the 24th inst. it was 14° below zero.

Pennsylvania Coal Trade.

The production of bituminous coal, in Pennsylvania, last year, amounted to 2,000,000 tuns, and the anthracite trade amounted to 7,258,891 tuns,—making an aggregate of 9,258,891. The total value of this coal, for 1856, reckoned at $4·25 a tun, at the place of delivery or consumption, would be but a fraction short of $40,000,000. In the year 1825, the amount of bituminous coal employed in the manufacturing establishments of Pittsburg and vicinity was one million of bushels, which, at eighty pounds to a bushel, would amount to 35,714 tuns. In 1842 the production largely exceeding the consumption, amounted to 420,000; which was increased in 1846 to 678,572 tuns. The bituminous coal produced during the past year was consumed principally in the iron works of western Pennsylvania; while, with the remainder, a profitable trade was carried on with the regions adjacent, with the West, and with Philadelphia.

In 1820, only 365 tuns of anthracite coal were mined. In 36 years it has grown to be the most magnificent mining interest on our continent.

A favorably situated coal mine is about the most valuable paying estate in our country. We perceive, by some of our Western exchanges, that there is a great scarcity of coal in some of the Western cities this winter, and that great numbers of the poor are suffering for want of fuel; this should not be. There is no country on the globe so well supplied with coal resources; the most abject pauper should not be allowed to suffer for want of fuel.

The Atlantic Telegraph Cable.

Mr. Newall, of Gateshead, Eng., is engaged to make one half of the Atlantic Telegraph, and Messrs. Kuper & Co., of London, the other half. These firms are under contract to complete their respective portions in the course of the ensuing summer. The Gateshead *Observer* says :—

"It may assist the reader to a fair conception of the immensity of the task, to state that Mr. Newall will have to twist strands of wire as an outer protection of the electric line itself, 25,000 miles in length, or long enough to go around the whole earth."

40,000 lbs. of cochineal are used at the Lawrence, Mass., woolen mills, annually.

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A BILL

To Amend the Several Acts now in force in relation to the Patent Office.

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled:

That the Commissioner of Patents may establish rules for taking affidavits and depositions required in cases pending in the Patent Office, and such affidavits and depositions may be taken before any justice of the peace, or other officer authorized by law to take depositions to be used in the courts of the United States, or in the State courts of any State where such officer shall reside; and in any contested case pending in the Patent Office it shall be lawful for the clerk of any court of the United States for any district or territory, and he is hereby required, upon the application of any party to such contested case, or the agent or attorney of such party, to issue subpœnas for any witnesses residing or being within the said district or territory, commanding such witnesses to appear and testify before any justice of the peace or other officer, as aforesaid, residing within the said district or territory, at a time and place in the subpœna to be stated; and if any witness, after being duly served with such subpœna, shall refuse or neglect to appear, or after appearing shall refuse to testify—not being privileged from giving testimony—such refusal or neglect being proved to the satisfaction of any judge of the court whose clerk shall have issued such subpœna. Said judge may, thereupon, proceed to enforce obedience to the process, or to punish the disobedience in like manner, as any court of the United States may do in case of disobedience to process of *subpœna ad testificandum* issued by such court, and witnesses in such cases shall be allowed the same compensation as is allowed to witnesses attending the courts of the United States. *Provided*, that no witness shall be required to attend at any place more than forty miles from the place where the subpœna shall be served upon him to give a deposition under this law. *Provided, also*, That no witness shall be deemed guilty of contempt for refusing to disclose any secret invention made or owned by him. *And provided, further*, That no witness shall be deemed guilty of contempt for disobeying any subpœna directed to him by virtue of this act, unless his fees for going to, returning from, and one day's attendance at the place of examination shall be paid or tendered to him at the time of the service of the subpœna.

SEC. 2. *And be it further enacted*, That for the purpose of securing greater uniformity of action in the grant and refusal of Letters Patent, there shall be appointed, in the same manner as is now provided by law for the appointment of Examiners, a board of three Examiners-in-Chief, to be composed of persons of competent legal knowledge and ability, whose duty it shall be to hear and determine upon the sufficiency of the references made by examiners, and the evidence in the case when adverse to the grant of Letters Patent, and to perform such other duties as may be assigned to them by the Commissioner.

That from the decisions of this Board appeals may be taken to the Commissioner of Patents in person, upon payment of the fee hereinafter prescribed. That the said Examiners-in-Chief shall be governed in their action by rules to be prescribed by the Commissioner of patents. No appeal shall hereafter be allowed from the decision of the Commissioner of Patents except in cases pending prior to the passage of this act.

SEC. 3. *And be it further enacted*, That the salary of the Commissioner of Patents shall be the same as that of the Superintendent of the Coast Survey, and of Weights and Measures; the salary of each Examiner-in-chief shall be the same as that of the principal assistant of the Superintendent of the Coast Survey, and the salary of the Chief Clerk of the Patent Office shall be the same as that of a Principal Examiner.

SEC. 4. *And be it further enacted*, That the Commissioner of Patents is authorized to restore to the respective applicants, or, when not removed by them, to otherwise dispose of such of the models belonging to rejected applications as he shall not think necessary to be preserved. The same authority is also given in relation to all models accompanying applications for designs. He is further authorized to dispense, in future, with models of designs when the design can be sufficiently represented by a drawing.

SEC. 5. *And be it further enacted*, That the tenth section of the Act approved the third day of March, Eighteen Hundred and Thirty-seven, authorizing the appointment of agents for the transportation of models and specimens to the Patent Office, is hereby repealed. The Commissioner of Patents is hereby authorized to employ a clerk to frank such letters and documents as he is, by law, permitted to frank.

SEC. 6. *And be it further enacted*, That the Commissioner may require all papers filed in the Patent Office to be correctly, legibly, and clearly written; and for gross misconduct he may refuse to recognize any person as a Patent Agent, either generally or in any particular case; but the reasons of the Commissioner for such refusal shall be duly recorded and subject to the approval of the President of the United States.

SEC. 6. *And be it further enacted*, That no money deposited as a fee, on any application for a patent after the passage of this Act, shall be withdrawn or refunded, that the three months' notice given to any caveator in pursuance of the requirements of the twelfth section of the Act of July fourth, eighteen hundred and thirty-six, shall be computed from the day on which such notice is deposited in the Post Office at Washington, with the regular time for the transmission of the same added thereto, and that so much of the thirteenth section of the Act of Congress, approved July fourth, one thousand eight hundred and thirty-six, as authorizes the annexing to Letters Patent of the description and specification of additional improvement, is hereby repealed.

SEC. 8, *And be it further enacted*, That so much of the laws now in force, as fix the rates of the Patent Office fees are hereby repealed, and in their stead the following rates are established:—

On filing each caveat, ten dollars.

On filing each specification, with not more than three claims, twenty dollars.

For each additional claim, more than three, ten dollars.

On issuing each patent, ten dollars.

On every appeal from Examiners-in-chief to the Commissioner, ten dollars.

On every application for a patent for a design, ten dollars.

On every application for the re-issue of a patent, thirty dollars.

On every application for the extension of a patent, one hundred dollars.

On filing each disclaimer, ten dollars.

On every application for an interference with a patent, ten dollars.

For certified copies of patents, &c., ten cents per hundred words.

For recording every assignment, agreement, power of attorney, &c., of three hundred words, or under, one dollar.

For recording every assignment, &c., over three hundred and under one thousand words, two dollars.

For recording every assignment, if over one thousand words, three dollars.

For copies of drawings, the reasonable expense of making the same.

SEC. 9. *And be it further enacted*, That no person who is a citizen or subject of any country, province, or colony, where citizens of the United States are prohibited obtaining Letters Patent on the same terms as the citizens of said country, province, or colony, shall be entitled to receive Letters Patent in the United States.

SEC. 10. *And be it further enacted*, That the Commissioner of Patents be and he is hereby authorized to contract for, a term not exceeding four years, for such a number of copies of the descriptions, specifications and drawings of the current patents as they are ordered to be issued, as will supply the Office for all purposes of reference, and for certified copies which are now by law furnished by the Patent Office, and for distribution. *Provided*, the cost thereof shall not exceed ten cents per copy, the copies required for the use of the Office shall be paid for out of the Parent Fund, and the copies for distribution shall be paid for out of any unappropriated funds in the Treasury, on the certificate of the Commissioner of Patents that said copies have been furnished.

SEC. 11. *And be it further enacted*, That the Commissioner of Patents shall distribute to each and every District Court of the United States, and to each County Court of the several States of the United States, a copy of all Letters Patent hereafter issued, upon which the seal of the Patent Office shall be impressed; and said copies shall be held to be competent evidence of the subject matter of said Letters Patent in all cases in which the original Letters Patent could be evidence; and certified copies thus made of any patent, shall be furnished to any applicant therefor, with the seal of the Patent Office thereon, and have the same effect, in law, as certified copies now do.

SEC. 12. *And be it further enacted*, That all copies, herein provided for, shall be executed in the Patent Office by the contractor therefor, under the supervision of the Commissioner of Patents, and subject to his approval, and no official original paper shall be taken from the Office for that purpose.

SEC. 13. *And be it further enacted*, That all acts and parts of acts, heretofore passed, which are inconsistent with the provisions of this Act, be, and the same are hereby, repealed.

Geography and the Human Race.

On the evening of the 15th inst., Professor Guyot, of Princeton, N.J, delivered a most interesting lecture on the above subject, before the American Geographical Society in the chapel of the University, this city.

He considered geography, in its bearing on the physical, mental, and moral condition of man, and saw, in the formation of continents, in the distribution of land and water, of plains and mountains, and in the influences and variations of climate, a portion of the plan of Deity for the civilization and elevation of the human being in this world, and for the development of those conditions of his nature which are to fit him for a yet higher existence in another. Beginning with the oceanic period, when water nearly covered the globe, and advancing through the subsequent geologic epochs, when land-masses began to appear as islands, and then as continents, the state of the earth under all these conditions suited the organism of the physical life which was on it. Nor was there any reason to believe that the existence of any of the species which successively appeared upon the earth was a fortuitous consequence of the existing condition of matter.

The world is suited to the wants of the life which is on it, and man, the highest organism of all, could not appear till the world was suited to him.

The Professor invited attention to one continent in particular, in illustration of his meaning; for continents, he said, were instrumentalities for mankind as a race, just as much as man's own body is an instrumentality of his soul. Asia was the continent that he would especially refer to, by far the largest upon the earth, the fitting root of all the races. It reaches into all the zones, possesses the coldest and the hottest regions—extends from the tropics to Siberia, where the earth is frozen forty feet below the surface. All climates on the globe are to be found there. Every condition of land, barren, fertile, dry, and watered, level and mountainous, alluvial plain and high table land were in that continent. All the civilizing races of men first started from Asia. It was the original seat of every race important to the destiny of the world, yet so varying in peculiarities of condition that all characters are represented. America, Europe, Africa, Australia, have each native races.—Asia alone has the representatives of all the races. Take man as developing himself, and we find in Asia all the germs and starting points of civilization. Inventions, histories, religions were first heard of in Asia, and they influence the world now, and will not cease to do so. Brahminism, Christianity, and Mohammedism all started from there.

The three great languages of the world, which had a synthetic influence in the formation of all others—the Japhetic, the Semitic, the Ethiopic—were originally Asiatic. The condition of man was directed by the geography of his birth-place. Alluvial plains became the first centers of civilization, because men were first drawn into societies by the pursuit of agriculture. There were five great alluvial plains in Asia, and there were five civilizations. But man, progressing and growing bolder, was no longer confined to the plains, but built his cities on the shores of the Mediterranean, and commerce began to flourish. And now those are masters of the world who are masters of the ocean, to whom all the oceans are open. The maritime peoples can alone be now said to sway the world.

Geographical positions are powerful instruments to form man's destiny. Is this a plan or an accident? Undoubtedly, a plan, a design on the part of Providence. The earth is everywhere prepared for a certain object, and all its arrangements are made for the highest developments of the existing life.

Growth of the United States.

The Washington *Globe* contains an able article on the growth of the country during the past year. From it we condense some interesting statistics:—

During the past year the prosperity of the United States has received an unexampled development. The various sources of true national wealth, the cultivation of new lands, the increase of the crops, the extension of manufactures, the working of mines, the import and export trade, foreign and home commerce, the construction and working of railroads, the growth and establishment of cities, have all wonderfully increased, and have added largely to the capital of the country. The transactions of the New York Clearing House for 1856, show an increase of $1,700,000,000, or thirty per cent on those of 1855, making the total for the year amount to the enormons sum of $7,300,000,000. The transactions of the London Clearing House in 1839, amounted to $4,772,000,000. They amount now to probably treble that sum. If so, the business of New York is equal to half that of London. In the imports and exports of New York, there has been an increase of 33 per cent on those of 1855. The increase in railroad traffic has been from twenty to thirty per cent.

Thirty-one millions of acres of land have been sold and appropriated; but the public lands yet remaining unsold in the Territories are equal in extent to the present thirty-one States, or more than all Europe, except Russia. Farming and industrial production has kept pace with other departments. Its approximate value, as estimated by the Secretary of the Treasury, from the returns of the census of 1840 and that of 1850, was, during the year 1856, about $2,600,000,000, or triple that of 1830. The value of the entire property of the United States, taxed and not taxed, he estimates at $11,317,000,000, exclusive of the public domain. He estimates the population at $26,964,312.

About 3000 miles of railroad were constructed in 1856; there are now 50,000 miles of telegraph wires in operation. There have been constructed two hundred and twenty-one steamers, and seventeen hundred and three sail vessels, with an aggregate tunnage of 459,394 tuns.

Notwithstanding this large addition, the official lists show a decrease in the merchant marine on that of 1855. During the year, the Federal Government has reduced its debt to twenty-five per cent. It now amounts to $30,000,000, with a residue in the Treasury of $22,000,000, after the payment of all demands. Our trade with Canada, under the new treaty, has increased from $20,000,000, in 1853, to $50,000,000 in 1856. The gold mines of California have supplied us altogether with about $170,000,000 in gold.—While the country has thus improved, villages have been tranformed into cities and cities have grown by the construction of buildings unequalled by any built in former years. In four years, the number of post-offices have increased twenty-five per cent., or from 20,901 in 1852 to 25,565 in 1856, showing the creation of 4,664 new centers of population in that short period.

Thus, year after year, are the United States advancing in material prosperity, as a natural result of the development of their boundless resources.

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S. G. W., of Mass.—Your plan of raising water is on the principle of what is known as Savary's Engine, an English invention, dating about A. D. 1650, and is the first recorded really practical application of steam as a motive agent. It is of course not now patentable. It is more profitable to use the same steam to work a pump.

Geo. W. Wilson, of West Worcester, Otsego Co., N. Y., wishes to know where small cast-iron pipes—two inches in diameter—for conducting water, are manufactured; also their cost per foot.

J. B., of Ohio—You are mistaken in reference to obtaining a greater from a less force by a centrifugal or any other machine. The good judges, whom you mention, are no judges at all, if they have given you certificates that 300 lbs. of power applied to your machine produced 100 lbs. of power: this is an impossibility.

A. L. B., of Phila.—Chlorine is a gas; if you pour some sulphuric acid on common salt and oxyd of manganese, in a retort, the gas that will be generated is chlorine; you can catch it in a receiver.

J. S., of Va.—Plaster of Paris casts generally become yellow in color, with every preparation that we have ever known applied to their surface, for preservation A strong solution of the sulphate of zinc and alum, applied to their surface, is the best preservative known to us.

L. D. R., of N. J.—You must go to work and invent a cheap method of producing the ornamental plates for coffins, then secure it by patent, and sell rights cheap to others. You will thus benefit both yourself and all those engaged in the same business.

T. M. P., of Md.—You can make gas from wood in a cylinder retort, without infringing any patent; because such gas retorts are quite old.

J. G. H., of N. H.—The Chinese were acquainted with the compass long ago, and it was brought from that country to Europe, by Marco Polo, in 1260, A. D.

J. F., of N. Y.—Calcined tartar is roasted tartaric acid. Purchase the tartaric acid of a druggist and roast it yourself in a small crucible.

J. L. H., of Mo.—We had not the back numbers to send to you. You cannot suppose we believe the great pit in the Mammoth Cave to be bottomless.

A. G, of France.—If you were to visit our forests and witness our backwoodsmen chopping through logs, you would then know the reason why their axe handles require to be curved. In Europe all the logs are sawed transversely with cross-cut saws. Without witnessing the method of chopping our forest trees, you could not obtain a correct idea of the advantages of the curved over the straight axe helves.

J. W. J., of Mass.—The assignee of an insolvent debtor cannot take out a patent for a new machine of the latter in his own name. A patent must be applied for in the name of the inventor, if he is alive. The act of conveying all the property of a debtor, for the benefit of all his creditors, covers all the property which he had in patents.

J. B. W., of Mich.—Use a little of the oxyd of manganese and salt with your hard scrap iron in the furnace, and you will find that it will be rendered soft. Potassium is out of the question to use in iron smelting.

F. B., of Me.—We would not advise you to buy a steam engine so small as "one horse power;" get a four horse power at least; a good four horse power engine, will drive a thrashing machine with separator, &c., attached. With a good boiler, half a cord of good pine wood, will drive it twelve hours. Convenience of transport is the only difference between a portable and a stationary engine. A common mechanic will soon learn to manage it. Write to those who manufacture and sell steam engines, and who advertise in our columns, regarding their price.

J. E., of Mass.—We are sorry that you did not give the subject of obtaining water on the west coast of South America more attention. The tide, perhaps, brought in the water of some river.

N. B., of N Y.—Your composition, as a substitute for leather, is new and patentable, but its value depends upon its quality and the cheapness of its manufacture, you will be more able to judge of this, when your experiments are completed.

J. H. D., of Mass.—We are aware of the centrifugal bullet-throwing machine, having been tried near this city, a number of years since, but, from the article in question, a knowledge of the nature of the machine could not be obtained; that it can perform the feats claimed for it, is as preposterous as to gain power from a lever. We believe that your improvement in book shelves is new and patentable. A bell has been connected with the knob of a door lock to give an alarm.

F. G. W., of Mass.—Write to Prof. Bache, of the Coast Survey, at Washington, and you may obtain the information you desire.

R. K., of Phila.—We do not see the advantage that would be obtained by employing an extra needle in the compass, to point due N. and S.—the diagram of the compass indicates all the points in the circle.

D. B. W., of Mo.—The best essay on electro-magnetism published in our country is in the Encyclopedia of Chemistry, published by H. C. Baird, of Philadelphia. Write to him respecting price, &c.

Money received at the Scientific American Office on account of Patent Office business for the week ending Saturday, Jan. 34, 1857:—

J. B. D. of Tenn. $30; J L. H. of Mo., $25; L. O. R. of Ill. $25; A. P. W, of Ill. $25; S. & M. of Ill. $80; D. B. of Iowa, $30; A. C. of N. H. $25; B. S. F. C. of Conn. $30; S. T. H. of Ill. $25; C. H. E., of Wis. $30; E. F.F. of Vt. $30; D. W. of N. J. $35; A. S. N. of Pa. $55; G. D. H. of Ill. $30; S. R. of N. Y. $30; W. S. of Ind. $25; M. L of Mass., $25; N. J. of N. Y. $55; W. F. E. of N. Y. $30; G. W. F. of Pa. $30; G. P. G, of N. Y. $30; J. A. P. of N. Y. $25; H. P. of N. Y. $20; T. J. deY. of N. Y. $25; C. M. of N. Y. $55.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Jan. 24, 1857:

A. P. W. of Ill.; L. O. R. of Ill.; W. H. McN. of N. Y.; H. P. of N. Y.; J. L. H. of Mo.; T. J. deY. of N. Y.; S. of Ind.; M. L. of Mass.; A. C. of N. H.; C. M of N. Y.

Important Items.

COMPLETE SETS OF VOLUME XII EXHAUSTED.—We regret that we are no longer able to furnish complete sets of the present volume. All the back numbers except 1, 2, 6, 9, 10, 11, and 13, we can yet furnish, if new subscribers desire to commence back to the beginning of the volume; but unless they specially request to the contrary when making their remittance we shall commence their subscription from date of receipt of the order.

PATENT LAWS AND GUIDE TO INVENTORS.—This pamphlet contains not only the laws but all information touching the rules and regulations of the Patent Office. Price 12 1-2 cents per copy. A Circular, giving instructions to inventors in regard to the size and proper construction of their models with other useful information to an applicant for a patent, is furnished gratis at this office upon application by mail.

RECEIPTS—When money is paid at the office for subscription, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a bona fide acknowledgment of the receipt of their funds.

PATENT CLAIMS—Persons desiring the claim of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office stating the name of the patentee, and date of patent when known, and enclosing $1 as fee for copying.

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IMPORTANT TO INVENTORS.

THE UNDERSIGNED having had ELEVEN years' practical experience in soliciting PATENTS in this and foreign countries, beg to give notice that they continue to offer their services to all who may desire to secure Patents at home or abroad.

Over *three thousand* Letters Patent have been issued, whose papers were prepared at this Office, and on an average *fifteen*, or *one-third* of all the Patents issued each week, are on cases which are prepared at our Agency.

An able corps of Engineers, Examiners, Draughtsmen, and Specification writers are in constant employment, which renders us able to prepare applications on the shortest notice, while the experience of a long practice, and facilities which few others possess, we are able to give the most correct counsels to inventors in regard to the patentability of inventions placed before us for examination.

Private consultations respecting the patentability of inventions are held free of charge, with inventors, at our office, from 9 A. M., until 4 P. M. Parties residing at a distance are informed that it is generally unnecessary for them to incur the expense of attending in person, as all the steps necessary to secure a patent can be arranged by letter. A rough sketch and description of the improvement should be first forwarded, which we will examine and give an opinion as to patentability, without charge. Models and fees can be sent with safety from any part of the country by express. In this respect New York is more accessible than any other city in our country.

Circulars of information will be sent free of postage to any one wishing to learn the preliminary steps towards making an application.

In addition to the advantages which the long experience and great success of our firm in obtaining patents present to inventors, they are informed that all inventions patented through our establishment, are noticed, *at the proper time*, in the SCIENTIFIC AMERICAN. This paper is read by not less than 100,000 persons every week, and enjoys a very wide spread and substantial influence.

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IRON FOUNDRY AND MACHINE SHOP FOR SALE.—The Proprietors of the Phœnix Foundry and Machine Shop, at Syracuse, N. Y., are desirous of going West, and offer it, under these circumstances, on very favorable terms for the purchaser. The buildings occupy 192 feet front on Water street, and extend in width to the Berm bank of the Erie Canal, admirably adapted by their location for an extensive and lucrative business. It is proposed to sell the ground, buildings, fixtures, patterns, and machinery with which it is amply supplied, and in perfect working order, and having all the business it can do, and capable of being extended to one half in addition to its present capacity. The present proprietors have had in it ten years of successful business, increasing from year to year, and none so prosperous as the current one, and the only motive for selling is that stated in the first sentence of this advertisement. A part of the purchase money can remain on mortgage. For further particulars call and see or address the subscribers at Syracuse, N. Y.
1* COBB & HERRICK.

INDELIBLE INK WANTED—JOHN EWEN, of Cincinnati, Ohio, wishes to obtain a recipe for making Indelible Printing Ink, to be used with type for marking clothing, and would pay liberally for it. 21 3*

FARMERS, PLANTERS, MECHANICS, READ—The Combination Patent Portable Upright Steam Saw Mill—simple, durable, efficient, and cheap. It commands the universal admiration of saw-mill men everywhere, and is being adopted in every part of this continent. The combination Patent Portable Shingle Mill—capable of sawing, planing, and jointing at the rate of ten thousand shingles in twelve hours. The shingles produced with this machine are as valuable in the market as the best shaved shingles. Ross's Patent Portable Grist Mill, which has received over sixty premiums, and is pronounced by the most experienced millers in this country and Europe to be the best mill ever constructed. It is cheaper than any other burr-stone mill. Woodworth's Planing Machine. Shapter's Portable Economic Engine. This power is more simple, more portable, more compact, more easily attended, and requires less fuel than any other machine. Send for pamphlet, which will give a full illustrated description of all our valuable patent machinery. J. M. EMERSON & CO.,
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A RARE CHANCE for Mechanics and others—A new, neat, and respectable business; affords 500 per cent. profit. But small means necessary. Address (enclosing stamp,) WM. HART, Mayville, Dodge co., Wis. 20 2*

SOUTHERN MACHINERY DEPOT—Number 98 Magazine st., New Orleans. Agencies and consignments of machines adapted to the Southern wants respectfully solicited. D. C. LOWBER. 20 7*

FOR SALE—Whitley's Patent Double Circular Saw Mill; patented March 4th, 1856. These mills are manufactured extensively in the West, and are fast taking the place of other mills. Some of the best States remain unsold. For rights, &c., address, A. L. WHITLEY, St. Louis, Mo. 20 2*

PATENT RIGHTS sold on commission by S. C. HILLS, 12 Platt st., New York, who has for sale the following: Clark's Water Feed and Indicator; Crosby's Slitting Mill; Devlan, Wood & Hancock's, Oil Saver; Creamer's Car Brake; Burnham's Suction and Force Pump; Van De Water's Water Wheel, &c. 20 tf

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WANTED—A purchaser for a valuable improvement in Spirit Levels. For particulars address B. F. NEAL, West Poultney, Vt. 20 2*

NOTICE—The subscriber is ready to contract for building steam saw mills, and warrant them to cut 2,000,000 feet of lumber in one year, with one up-and-down saw, and to make the dust and chips made by the saw make the steam to do it. Address, S. E. PARSONS, Wilkesbarre, Pa. 20 4*

THE BEST PLANING, TONGUEING, AND GROOVING MACHINE IN THE WORLD.—Patented November, 21st, 1854, and November. 13th, 1855. These patents were obtained for improvements upon the celebrated Woodworth Planing Machine, the patent for which expired Dec. 26, 1856. By the combination of these several inventions a machine is produced of unrivalled excellence. A Gold Medal for this invention was awarded by the Mass. Char. Mech. Asso., at their Exhibition of 1856. Machines of all kinds and sizes, from $150 to $2000. All machines warranted to give entire satisfaction, and to be superior to any other machines now in use. For further information address the patentee. JAMES A. WOODBURY,
20 7* No. Scollay's Building, Court st., Boston, Mass.

TRUSTEE'S SALE OF MACHINERY.—One 25 ft. Planer, two 12 ft. do., two 10 ft. d., three 9 ft. do., four 8 ft. do., five 6 ft. do. (new.) One 12 ft. Lathe, nine 8 ft. do., twelve 6 ft. do.; 6 Hand Lathes; 2 Gear Cutters, 3 Upright Drills, 1 Bolt Cutter, 1 Shaft Straightener, Planer, Centers, Chucks, &c. 4 sets 23 in. swing heads, counter shaft, and carriages; 4 sets 12 feet cross-heads; Planer and Lathe Patterns, and all kinds of small tools used in a machine shop. To be sold cheap for cash, said machinery is in good order. N. D. SPERRY, Trustee of the Estate of John Parshley.
New Haven, Conn., Jan. 2, 1857. 19 4

WOODWORTH'S PATENT PLANING, Tonguing, and Grooving Machines.—The subscriber, from his twenty-four years' experience both in the use and manufacture of these unrivalled machines, is prepared to furnish them of a quality superior to any that can be procured elsewhere for the same money. Prices from $85 to $1550. Also several good second-hand Planing Tonguing, and Grooving Machines for sale.
JOHN GIBSON,
19 12* Planing Mills, Albany, N. Y

TO ARCHITECTS—A premium of $250 will be paid for the best, and one of $100 for the second best plan, with specifications, for the college edifice for the New York State Agricultural College, to be built at Ovid, Seneca county, the coming season. There will be required a Culinary Department, in all its details, a Dining Hall and Laundry, to accommodate from 300 to 400, a Lecture Room, capable of seating 400 to 500, and accommodations for the steward and his family in the basement. In the first story will be required a President's Reception Room and an Office, five Professors' Rooms, five Recitation Rooms, a Library, and a Chemical Laboratory large and well lighted. The residue of the first and the three stories above, to be appropriated for Students' Rooms or Dormitories, not less than 175 in number, and not less than 16x10 feet in size, with a bed-room connected; the rooms lighted with one large window; halls not less than 10 feet in the clear, with stairways to approach them. Building to be four stories above the basement. Plans for heating, ventilating, and lighting in the most approved modern manner will be expected. The walls to be of stone or brick. If of stone, to be laid in courses rough hammered, corners suitably dressed, water tables, window caps and sills, cut; stone delivered on the spot for about $2·50 to $2·75 per cubic yard, mainly shaped for laying. Cut stone a higher price. A suitable front doorway of stone, with a cap of suitable depth to receive an appropriate design, with stone steps to reach it; all to be done in a plain, but neat and substantial manner, and with the strictest economy. Cost to be estimated. Plans and specifications to be completed and sent to J. P. Johnson Esq., State Agricultural Rooms, Albany, N. Y., on or before the 10th of February next. The subscriber may be referred to, if desired, at Waterford, Saratoga county N. Y. S. CHEEVER, President.
December 22d, 1856. 18 5

CRIDGE & WADSWORTH'S IMPROVED Oscillating Steam Engine. Patented December 12th, 1854. After a thorough practical test for about two years of the above improvement, our success warrants us in inviting the closest examination into its reputation in our own locality, and the great popularity of our engines in the midst of the most active and intelligent competition. To engine builders and capitalists we present the following considerations. An engine unsurpassed for durability, compactness, and simplicity, cutting off the steam close to each end of the cylinder, by means of a side pipe, adjustable by set screws, securing a perfectly steam-tight valve with little or no friction or pressure, combining all the advantages of a double slide valve engine, and at the same time dispensing with all cams, camrods, cross-heads, rock-shafts, slide-valves, etc., saving their cost of construction and necessary waste of power in running And finally, we present an improvement (applicable to all cylinder engines) which enables the manufacturer to construct them at one half the cost of any other engine of the same value. This last consideration commends it to the immediate and earnest attention of all persons interested or engaged in manufacturing engines. Believing that the improvement is destined to revolutionize this branch of manufacture, we have decided upon selling such a number of shop rights as will introduce it into general use, and at the same time secure the persons purchasing against too much competition with each other, and on such terms as will bring it within the reach of all in moderate circumstances. Letters of inquiry in regard to terms, addressed to the undersigned, will meet with prompt attention. For explanations see No. 11, Vol. 12, SCI. AM. CRIDGE, WADSWORTH & CO., Pittsburg, Pa. 18 6

ENGRAVING ON WOOD and **MECHANICAL DRAWING**, by RICHARD TEN EYCK, Jr., 128 Fulton street, N. Y., Engraver to the Scientific American. 16tf

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COMMERCIAL AGENTS, able and honest Men from N. England or N. York. A.W. Harrison, Phila. 16 13*

PORTABLE STEAM ENGINES.—S. C. HILLS No. 12 Platt st., N. Y., offers for sale these Engines, with Boilers, Pumps, Heaters, etc., all complete, and very compact, from 2 to 10 horse power, suitable for printers, carpenters, farmers, planters, &c. A 2 1-2 horse can be seen in store, it occupies a space 5 by 3 feet, weighs 1500 lbs., price $240; other sizes in proportion. 1 e3w

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ST. CLAIR CAR MANUFACTORY—St. Clair, Schuylkill Co., Penn. Coal and freight cars of every description. Workmanship and material guaranteed equal to any manufactured in the United States. Bush & Lobdell's celebrated wheels used exclusively. CHAS. R. ABBOTT, Proprietor. 9 12*eow

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ENGINEERING.—The undersigned is prepared to furnish specifications, estimates, plans in general or detail of steamships, steamboats, propellers, high and low pressure engines, boilers and machinery of every description, Broker in steam vessels, machinery, boilers, &c. General Agent for Ashcroft's Steam and Vacuum Gauges, Allen & Noyes' Metallic Self-adjusting Conical Packing, Faber's Water Guage, Sewell's Salinometers, Dudgeon's Hydraulic Lifting Press, Roebling's Patent Wire Rope for hoisting and steering purposes, Machinery Oil of the most approved kind, etc.
CHARLES W. COPELAND,
1 eowtf Consulting Engineer, 64 Broadway.

A NEW AND SCIENTIFIC INVENTION—Dr. Cheever's Galvano-Electric Regenerator. Patent issued Jan. 15th, 1856. A circular relating to the use of the instrument, embracing a general treatise of atony of the spermatic organs, the result of which tends to soften ing the medullary substance of which the brain is composed, may be had gratis, and will be sent to any address by mail by their indicating a desire to receive it. All letters should be directed to DR. J. CHEEVER, No. 1 Tremont Temple, Boston. 15 4eow*

WOODWORTH'S PATENT PLANING MAchines of every kind and all prices. A large assortment on hand; and I am prepared to construct any machine to order from ten days to two weeks, and guarantee each machine to be perfect in its construction, and give purchasers entire satisfaction. The patent has expired, and will not be renewed. I make this business exclusive, manufacturing nothing but the Woodworth Machines, and for that reason can make a better article for less money; and with my fifteen years' experience I fully guarantee each machine to come up to what I am willing to recommend, that is, that each machine shall be more than equal to any other manufactured for the same price. JOHN H. LESTER, 57 Pearl st., Brooklyn, N. Y., three blocks above Fulton Ferry. 20 tf

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RECIPE FOR MAKING HONEY as good as that made by bees, and which does not cost over six cents per pound, sent for one dollar. N. R. GARDNER, Peace Dale, R. I. Any paper giving this advertisement three insertions, and sending a copy of it, will receive the recipe free. 18 5*

BARREL MACHINERY—CROZIER'S PATENT—This machinery was awarded a gold medal at the late Fair of the American Institute. One set of these machines, driven by 12-horse power, and with the assistance of 20 men make an average of 600 barrels per day of 10 hours, as our factory in Oswego, N. Y. A portion of the machinery may be seen at Messrs. Leonard & Wilson's, 60 Beaver st., New York, to whom reference may be made. For machines and rights address,
WELCH & CROZIER,
15 10* Oswego, N. Y.

NOTICE—I will receive applications until the 1st of June for the right to make and sell my patent Double-Jointed Buckle, the best yet invented; one answering for the whole wardrobe; and will last to the third and fourth generation, if well made. Address,
WILLIAM SLADE,
15 7* Gum Creek, Dooly Co., Ga.

THE PATENT EMPIRE POWER LOOMS for high speed, increased production of cloth, economy in operating, and superior make, are manufactured at the Empire Loom Works, Stockport, Columbia county N. Y. W. BENJAMIN & CO.,
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WRIGHT'S PATENT SECTIONAL SPRING BED BOTTOM—The cheapest and most perfect article in use. LIPPINCOTT & CO., Manufacturers, No. 1180 Broadway, N. Y. 10 3m*

JAMES O. MORSE & CO., 79 John street, N. Y. (between William and Gold streets,) Manufacturers and Dealers in all descriptions of Pipes for Steam, Gas, and Water, together with every variety of fittings for the same; Steam Boilers and Boiler Flues, Stop Valves and Cocks, Steam Whistles, Oil Cups, Gauge Cocks, Governor Valves, Steam and Water Gauges, Steam, Power, and Hand Pumps, Steam Apparatus for warming buildings, Gas Apparatus for towns and factories. 17 13

RUNYAN & HOSTER, of Seneca Falls, Seneca County, N. Y., are now prepared to fill orders for any or all sizes of Lewis' Improved Direct Double-Acting Force Pump, the best pump in use. A full description of it may be found in the Scientific American of March 22d, 1856. Rights are also offered for sale by States or otherwise. R. & H. refer to J. T. Miller, Esq., P. M., Seneca Falls, N. Y. 13 12*

STOVE POLISH—The best article of the kind yet invented for family use. Sold wholesale and retail at 114 John st., New York, by QUARTERMAN & SON. 12 tf

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30 HORSE STEAM ENGINE—At the Crystal Palace, called the "Endeavor," the best engine ever exhibited by the American Institute; will be sold low if applied for immediately. S. C. HILLS,
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CAST-STEEL WIRE DRAWERS—Union Works, Patterson, N. J. Orders solicited and punctually filled by CHAMBERLIN & CO. 14 8*

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FORBES & BOND, Artists, 89 Nassau st, N.Y., Mechanical and general Draughtsmen on wood, stone, &c

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LAP-WELDED IRON BOILER TUBES.—Prosser's Patent.—Every article necessary to drill the tube-plates, and set the tubes in the best manner.
18 tf THOS. PROSSER & SON, 28 Platt st., N. Y

PAGE'S PATENT PERPETUAL LIME KILN, will burn 100 barrels of lime with three cords of wood every 24 hours; likewise my coal kiln will burn 150 bushel with 1 tuh bituminous coal in the same time; coal is not mixed with limestone. Rights for sale.
45 26 C. D. PAGE, Rochester, N. Y.

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50 STEAM ENGINES—From 3 to 40-horse power also portable engines and boilers; they are first class engines, and will be sold cheap for cash. WM BURDON, 102 Front st., Brooklyn. 14 tf

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GOLD QUARTZ MILLS of the most improved construction; will crush more quartz and do it finer than any machine now in use, and costs much less. WM BURDON, 102 Front st., Brooklyn. 14 tf

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OIL! OIL! OIL!—For railroads, steamers, and for machinery and burning—Pease's Improved Machinery and Burning Oil will save fifty per cent., and will not gum. This oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough, and practical test. Our most skillful engineers and machinists pronounce it superior and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The Scientific American, after several tests, pronounced it "superior to any other they have ever used for machinery." For sale only by the inventor and manufacturer.
F. S. PEASE, 61 Main st., Buffalo, N. Y.
N. B.—Reliable orders filled for any part of the United States and Europe. 4 tf

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NORCROSS ROTARY PLANING MACHINE.—The Supreme Court of the U. S., at the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb, 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks is not an infringement of the Woodworth Patent.
Rights to use the N. G. Norcross's patented machine can be purchased on application to N. G. NORCROSS,
Office for sale of rights at 27 State street, Boston, and Lowell, Mass, 45 6m*

NEW HAVEN MFG. CO.—Machinists' Tools, Iron Planers, Engine and Hand Lathes, Drills, Bolt Cutters, Gear Cutters Chucks &c., on hand and finishing. These Tools are of superior quality, and are for sale low for cash or approved paper. For cuts giving full description and prices, address, "New Haven Manufacturing Co., New Haven, Conn. 14 tf

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HARRISON'S 30 INCH GRAIN MILLS—Latest Patent.—A supply constantly on hand. Price $200. Address New Haven Manufacturing Co., New Haven, Conn. 14 tf

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BOILER INCRUSTATIONS PREVENTED—A simple and cheap condenser manufactured by Wm. Burdon, 102 Front st., Brooklyn, will take every particles of lime or salt out of the water, rendering it as pure as Croton, before entering the boiler. Persons in want of such machines will please state what the bore and stroke of the engines are, and what kind of water is to be used. 14 tf

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Science and Art.

Gun Cotton and Gunpowder.

Gun cotton, also known as nitrate of lignine will not explode until raised to a temperature of from 330° to 356° Whether applied in guns or for blasting rocks, it is, weight for weight, from four to six times as powerful as gunpowder.

A charge of gun cotton of the same force as the usual charge of powder occupies about two-thirds the space in a gun, and consequently gives a better effect. For blasting, it is compressed, and entirely concealed in cartridges, with a safety-fuse attached.

Gun cotton explodes more rapidly than gunpowder, and insures somewhat more accuracy in firing from the shoulder.

It makes very little smoke, and leaves hardly any solid or liquid residuum. The gun hardly becomes foul with the longest use. The gun is not so rapidly heated. No priming is required, as the flame from the cap passes down the touch-hole sufficiently far to ignite the cotton below.

Gun cotton is not at all injured by being wetted. No apprehension need be entertained for the magazine of a ship catching fire, for if the cotton is not kept always in water, arrangements may be made for rapidly wetting it. There would no longer be any danger for magazines, as the cotton can be dried rapidly in small quantities, as required. The great waste from ammunition spoiled by wet would be avoided.

The defects which have been urged against gun cotton are: 1st, it may explode by a blow, or in ramming down. This is never the case unless the blow has by some means produced a temperature of 330° In many thousand trials no accident has ever occurred.

2nd, it may burst the gun. Accidents of this kind have only arisen from using a charge of cotton equivalent to many times the usual charge of powder.

There is, however, a danger in using it which arises from the difficulty of persuading men that a substance identical in appearance with common cotton is quite as dangerous as gunpowder.

Chloroform in Sea Sickness.

Dr. Landener, of Athens, in Greece, announces that he has discovered a specific for sea sickness. He gives 10 or 12 drops of chloroform for a dose in a little water, and this, it is stated, soon removes the nausea. He tried the effects of this on twenty passengers on a very rough voyage, eighteen of whom were cured of their sea sickness by one dose, and the remaining two with two doses. This remedy, if it is as effectual as it is stated to be, is certainly the best, because the most simple, that has yet been brought to public notice.

Air Exhauster.—Fruit, Vegetable, and Flower Preserver.

The accompanying figures illustrate an apparatus for exhausting air from jars, containing fruit, &c., without heating their contents; also a new top for jars, to be used with this apparatus. A patent was issued for this invention to A. M. Purnell, M. D., of Washington, D. C., on the 25th of November last.

Fig. 1 is a perspective view of the apparatus; fig. 2 is a transverse section of the exhauster; and fig. 3 is a view of a jar with the top, to be used in connection with the exhauster.

A is the exhauster can, made of tin; B is a tin tube communicating with the can, A, by means of a small hole; C is also a tin tube communicating with tube B, by a small hole, and is open at both ends; *d*, fig. 3, is a tin tube with a flared rim, D, around it, near its middle; E, fig. 3, is a tin top, fitting loosely over tube *d*. F is a short tube soldered to the top, E; a smaller tube, G, is also soldered to the top, E, and inside of F, thus leaving a space between the two tubes, F and G. H is a block of wood, or any other firm body between can, A, and the glass jar, K—which are shown in fig. 1 with the top in connection. I is the hand of the operator, and J is a heated vessel or oven.

The tin can, A, is of such a size as will contain about half a gallon. As near its center as possible, a tin tube, L, two inches in diameter, is soldered to its top only, it has several holes punched in it near its upper end, for the passage of steam and air, it rests upon the bottom, and its object is to brace the can and prevent a collapse of its top or bottom,

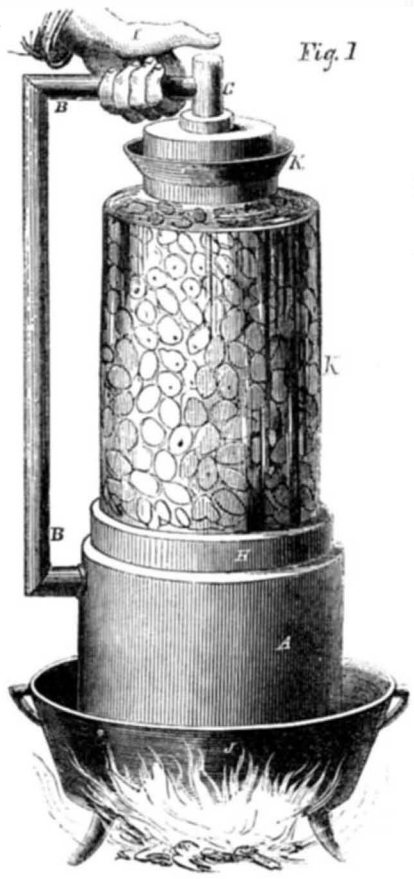

Fig. 1

after the expulsion of air. The tin tube, B, is soldered to the side of the can and the tube, *d*, is made to fit smoothly in the jar, K, intended to be used. The flange, D, flared at top and narrow at its bottom, is for holding cement. The space that is left between the two tubes, F and G, is for the introduction of melted cement. In the center of the top, E, being also in the center of tube G, is a small hole of one-eighth of an inch in diameter.

Operation.—A little water, about four or five ounces, is introduced into the exhauster, A, fig. 2, by first heating it a little to drive out a portion of the air, then dipping tube C in cool water, which forms a partial vacuum in the vessel, and the water then flows in. The tube, C, is then wiped dry. The lower part,

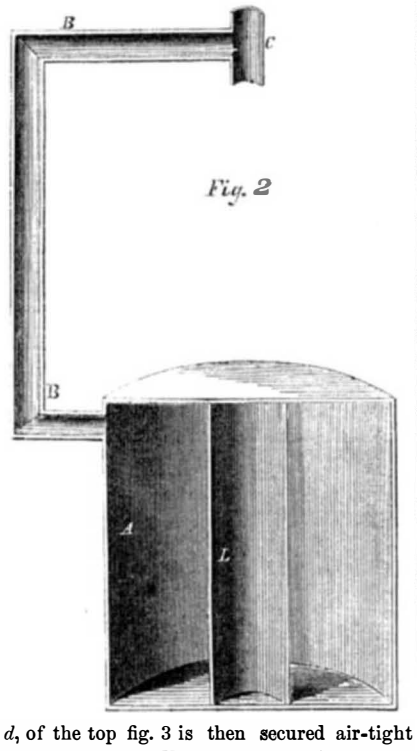

Fig. 2

d, of the top fig. 3 is then secured air-tight to the top of jar K, by means of the cement which adheres to glass and tin (and will not melt at the temperature of boiling water.) The jar being filled with fruit, as shown in fig. 1, and the top being placed in its position, and the cement in the groove for its reception being cooled, the tube G, (figure 3,) and tube C, (figure 2,) are connected together, the pipe, C, slid over G, and cemented, to form an air-tight outward connection between them all—the whole apparatus being arranged as shown in fig. 1. The cement is composed of equal parts of beeswax and rosin. A small round piece of paper dipped in the melted cement, and allowed to cool or a piece of thin india rubber is dropped in through the top of tube C, to cover the hole underneath. A cork is made to fit loosely in tube G—having a hole through a center—and is dropped through the top of the pipe, C, and falls on the waxed paper or india rubber valve under it, and keeps it from being displaced. The exhauster being placed on a hot oven, stove, or over a spirit lamp, as shown in fig. 1; it is kept there until the top horizontal tube becomes warm to the hand; the top of tube C is then closed with the thumb, and the exhauster and cannister lifted out the heating vessel J; and the exhauster placed in water until it is perfectly cold; this forms a vacuum in it by the condensation of the steam, by which the air is drawn from the jar, K, through tube B. The thumb of the operator may now be removed from the top of pipe C, when the outward pressure will then close down the small valve of waxed paper or india rubber under the cork mentioned, and thus exclude the air from entering the jar from the outside.

The operations of heating and cooling the exhauster, A, as described, may be repeated as often as is necessary, until the air is sufficiently exhausted from the jar and its contents. The block, H, is then removed; the tubes, C and G, separated, and the cork taken out, but the cemented piece of paper—the valve—allowed to remain, and the tube, G, then plugged with a stopper of cement.

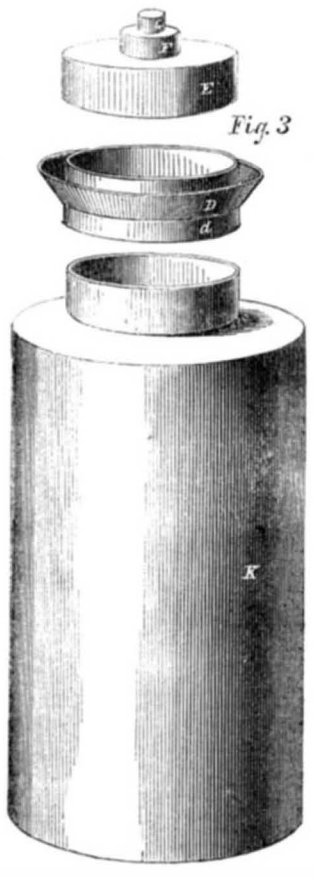

Fig. 3

When it is desired to preserve fruit with syrup in these jars, the syrup is put in with the fruit, the air exhausted, and again admitted to the jar, and the syrup thus made to penetrate and saturate the fruit; the superfluous syrup is then poured off, the air exhausted, and the jar sealed, as has been described.

The principle embraced in the preservation of fruits, vegetables, and flowers, in this invention, is removing or exhausting the oxygen of the atmosphere from the organic substances to be preserved, without submitting them to heat. The claim embraces the apparatus illustrated and described for this purpose.

Dr. Purnell informs us that he can exhaust the air more perfectly from canisters, by this apparatus, than by the very common method of placing them in boiling water to expel the air. Many articles, such as fruit, usually eaten in a fresh or uncooked state, cannot be heated without having their flavor completely altered, therefore to preserve them with their pristine taste, they must be treated cold, as by this apparatus. In preserving fruit with syrup, by boiling in sugar in the common manner, more sugar than is agreeable to the taste is required to be used, for the purposes of preservation; but by this method of treating such fruit preserves, they do not require so much sugar.

All kinds of fruits, we are informed by the patentee, are thus preserved by this apparatus, and their peculiar flavors retained; and flowers are also thus preserved in such glass jars, with all their variegated colors unblanched, during the whole winter season.

Any kind of glass or stone-ware jars, having a wide mouth, may be employed; it is only necessary to have the tops made to suit them.

More information may be obtained by letter addressed to the patentee at Washington, D. C.

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